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POLIOMYELITIS OCCURRING AFTER ANTIGEN INJECTIONS

By GAYLORD W. ANDERSON, M.D., DR. P. H., AND AUDREY E. SKAAR, B.S.
Minneapolis

DURING the past year several investigators have reported the occurrence of poliomyelitis within a few weeks after injection of some antigen. Martin[1] in England noted 15 cases in which paralysis of a single limb occurred within 28 days of injection of antigen into that limb, and two cases following penicillin injections. In Australia, McCloskey,[2] during a study of the 1949 outbreak, recorded 38 cases that developed within 30 days of an antigen injection, finding an association between the site of paralysis and that of the recently antecedent injection. His findings, contrary to those of Martin's, suggested a greater association with pertussis vaccine than with other antigens. Geffen,[3] studying the 1949 poliomyelitis cases in London, observed 30 patients who had received an antigen within four weeks, noting also that the paralysis involved especially the extremity into which the injection had been given. In a subsequent survey of 33 administrative areas in England, Hill and Knowelden[4] found 42 children who had been immunized within a month. They noted not only a correlation with the site of injection but also a distribution of paralysis quite different in this group as compared with a group not immunized during the preceding month. In their conclusions they emphasized the lack of evidence that inoculations carried out more than a month prior to the onset had any effect upon either incidence or localization of paralysis, but suggested that certain cases of the first-month group might "not have been diagnosed if their inoculation had not brought them into the paralytic group." Banks and Beale[5] observed 14 cases that followed within two months after immunization, noting also a correlation between site of injection and localization of paralysis, as well as increased severity of residual paralysis. All these observers noted a concentration of such cases in younger children, especially those under 2 years of age. Only McCloskey[2] and Geffen[3] found any suggestion of asso-

From the School of Public Health, University of Minnesota Medical School, Minneapolis.
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ciation with a particular antigen. In the discussion of this problem during the April 1950 meetings of the Royal Society of Medicine, Burnet and others[6] stressed the apparent relationship to multiple antigens containing a pertussis component.

The present study is based on analysis of the epidemiologic case histories obtained on 2709 cases of poliomyelitis during the 1946 outbreak in Minnesota. During that year 2881 cases of poliomyelitis were reported to the State Department of Health. So far as possible, histories were obtained on all of these, but for various reasons such as removal of the family from the state, refusal to cooperate, or death of a single person without local relations, about 200 cases were missed. At the same time, histories were obtained on a few obvious cases that were not reported to the Health Department. So far as can be determined, there was no bias in the composition of either group that would have had an appreciable effect on the results here reported. The histories were obtained by public health nurses except for a few dozen by medical students. The average history was taken about three months after the onset of the illness. While this delay might be interpreted as reducing the reliability of the histories, it probably increased the accuracy with respect to most items. A large element of unreliability enters into a history taken from a mother during the acute stage of poliomyelitis when she is worried as to possible death of the child or about probable residual crippling. A history taken three months later under less emotional stress, and after the family has had full opportunity to relive and discuss the events just prior to the acute illness, will probably yield a more accurate record.

Among the items included in the epidemiologic case histories taken in 1946 was a question about all injections or immunizations the patient had ever received, date of injections and name of physician (or clinic) giving the injections. In some instances the history contained the exact date but more commonly only the year of injection or the age of the child when immunized. Of the 2709 histories obtained, 2677 contained a definite record of immunization or a specific statement that the patient had never been immunized. Most of the 32 on which there was no record were adults; only two were under 8 years of age, too small a number for their omission to be of significance in this study.

All histories of children 7 years of age or under were selected for more detailed study of relationship to prior immunization. Inquiries were addressed to the physician or clinic in all cases which showed a record of receiving any antigen injection during 1946 or at such an age that one might presume the injection to have been given in 1946. Inquiry was made as to actual date of injection, nature and source of antigen used, and site of injection. In many cases the physician's records did not show the actual site but a probable site could be presumed from the standard practice of the physician or clinic as to sites of injection for children of a given age. All hospitalized patients which, on reply from the physician, could be classed as having received some antigen injection within the six months preceding the onset of poliomyelitis were checked further by study of hospital records to verify the history as to extent and site of paralysis. Three cases were not hospitalized, so that no further check could be made. All of these showed leg involvement though the antigen, administered three to five months earlier, had been injected into the arm.

Table 1 shows the number of cases on which there was a history of antigen injection during the six months antecedent to the attack of poliomyelitis. It will be noted that 85 cases are listed as "confirmed." This term is used here to include those cases on which the physician or clinic had a definite record of date of immunization. Forty-two cases are

listed as "not confirmed." Ten of these listed as "no reply" were so classified because the physician or clinic failed to reply to repeated inquiries or requests for information. The other 32 were classified as "date not confirmed" because the physician, though replying to the letter, could not confirm the fact that he had given an antigen injection on a given day. In some instances the reply acknowledged that such an injection might have been given but not recorded; in other instances doubt was expressed as to the accuracy of the history obtained from the mother, even though in several cases the mother had named the actual date of injection. In three cases the physician had died and the records were not available. The "not confirmed" cases thus represent a group on which

TABLE 1

CASES OF POLIOMYELITIS APPARENTLY OCCURRING WITHIN 6 MONTHS AFTER ANTIGEN INJECTION

Minnesota—1946

Onset by Mo. After Most Recent Injection	Confirmed	Not Confirmed	
		Date Not Confirmed	No Reply
1st	33	5	2
2nd	12	1	0
3rd	15	2	1
4th	11	4	0
5th	10	3	1
6th	4	1	1
7th	—	1	0
Unknown	—	15*	5
	—	—	—
	85	32	10

* In 5 of these the history suggested that the immunization was at least 2 mo. prior to onset.

the information given by the mother could not be confirmed for one reason or another. They have been distributed in table 1 according to the probable month of onset as dated from latest prior antigen injection, but 20 of the 42 have been put in a class of "unknown" interval as the history merely stated that the injection had been given in 1946; in five of these the case was clearly not in the first-month group though more precise estimate of interval was not possible. Of the 42 "not confirmed" cases seven could be classed as possibly immunized during the month preceding the onset of poliomyelitis. Since the dates could not be verified these "not confirmed" cases are omitted from further discussion in this paper.*

From table 1 it will be noted that of 85 confirmed cases occurring within six months after injection of an antigen, 33 had had their most recent injection within the preceding month, 12 in the second preceding month and 15 in the third preceding month. This concentration of cases occurring within a month following some injection suggests that there may have been some causal relationship. Two alternative hypotheses

* One case has also been omitted who developed paralysis of the right arm and shoulder 7 days after receiving diphtheria-pertussis antigen in an arm (unspecified). Although the case was originally reported as poliomyelitis and admitted to the hospital as such, examination of the hospital record showed that the diagnosis had been changed to Erb's palsy.[7]

are, however, obvious. The first of these is that the parent in giving the history would have been more likely to have recalled an event occurring during the month immediately preceding the poliomyelitis than to have remembered a similar event in some earlier month. This seems unlikely since a specific question as to immunization and date of such was asked and the answer did not reflect the parent's initiative in recalling or suggesting an observation.

The other hypothesis is that the distribution of cases by month subsequent to injection is a reflection of the amount of immunization performed in the community during differ-

TABLE 2

DISTRIBUTION OF CERTAIN ANTIGENS BY MINNESOTA DEPARTMENT OF HEALTH
January through September 1946

Type of Antigen	Amounts Shipped								
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Smallpox Vaccine Total No. Points	905	1305	4900	12470	2915	580	390	520	3165
Pertussis Vaccine 24 cc. Pkg.	63	98	94	165	138	83	95	101	113
Diphtheria Toxoid Formalin—30 cc. Pkg.	0	82	0	120	0	2	1	0	101
Diphtheria Toxoid Appt.—5 cc. Pkg.	4	507	276	42	26	11	4	15	20
Diphtheria Tetanus Tox. 10 cc. Pkg.	304	523	1404	3092	455	144	114	172	1165

ent seasons. To a certain degree this is probably correct so far as concerns the few cases immunized six months prior to onset of poliomyelitis as these would have represented cases completing their immunizations in January, February or March.* The distribution of antigens from the State Department of Health (table 2) suggests, however, that there was a concentration of immunizations in April and May. To a high degree, however, these represent children immunized in clinics, and largely school children, whereas, as shown later (table 12), most of those who developed poliomyelitis in the month after immunization were under 2 years of age. Although no records of the total number of immunizations carried on in any particular month are available, the records of the 85 confirmed cases may be taken as a sample (though very small) of probable seasonal distribution, as the fact that these children subsequently developed poliomyelitis could not have influenced the decision to give them antigen injections prior to the attack. The seasonal distribution of the 33 first-month cases and of the 52 second-to-six-month cases is shown in table 3, as compared with the number of antigen injections received by these children during the previous months. It is apparent from this table that the seasonal distribution of injections does not coincide with that of the cases of poliomyelitis

* Of the 2709 cases on which histories were obtained, 2416 had their onset between June 1 and September 28.

nor does it even parallel the latter with a constant time interval. The peak of immunization was in May, that of the 85 cases late in July or early August, which was the peak for the 1946 outbreak in Minnesota. The first-month cases showed less variation, being spread more or less evenly from July through September yet the amount of immunization declined sharply after July. Separate analysis of the children under 2 years of age and of each group according to type of antigen showed no essential differences from the pattern of the total group. There is thus nothing in these data to support the hypothesis that the larger number of cases developing within a month after immunization than in

TABLE 3

SEASONAL DISTRIBUTION OF POLIOMYELITIS CASES IMMUNIZED IN 1946 AND OF IMMUNIZING INJECTIONS RECEIVED BY THEM IN 1946

Minnesota—1946

	Seasonal Distribution of Cases by Mo. of Onset*				Seasonal Distribution of Injections Received	
	Developed Poliomyelitis 1st Mo. After Injection		Developed Poliomyelitis 2nd–6th Mo. After Injection			
	Age 0–7	Age 0–1	Age 0–7	Age 0–1	Age 0–7	Age 0–1
Jan.	0	0	0	0	14	14
Feb.	0	0	0	0	11	8
Mar.	0	0	0	0	18	12
Apr.	0	0	0	0	32	16
May	0	0	0	0	38	22
June	1	0	1	0	35	25
July	11	7	17	9	26	15
Aug.	9	6	20	5	6	2
Sept.	7	4	10	5	9	5
Oct.	5	2	4	0	3	1
Total	33	19	52	19		

* Of the 2881 cases officially reported in 1946 in Minnesota, 36 had their onsets in June, 791 in July, 1219 in August, 558 in September and 191 in October.

the second, third or fourth month is due to a larger amount of immunization being performed during the poliomyelitis season. It is logical to infer, therefore, that the concentration of cases within a month after immunization suggests some causal relationship operating only during that first month.

Further evidence of such a relationship is contained in tables 4 and 5. The former shows the relationship between the site of the last injection and the localization of the paralysis. Those showing subsequent temporary or permanent paralysis of the extremity into which the injection was given are listed as "correlated cases."* Those in which the injected extremity was not involved are classified as "noncorrelated cases." A few cases are listed as questionably correlated. These include certain ones in which there was involvement of the neck muscles (sternocleido-mastoid) following injection into the

* Many of these also had involvement of some other extremity but in almost all such cases the injected extremity was the most severely involved.

TABLE 4

RELATIONSHIP BETWEEN LOCATION OF PARALYSIS AND SITE OF ANTECEDENT ANTIGEN INJECTION
PATIENTS 0–7 YR. OF AGE
Minnesota—1946

Mo. After Injection	Total Cases	Correlated Paralysis	Noncorrelated Paralysis	Questionable Correlation
1st	33	19 (58%)	12	2
2nd	12	1	9	2
3rd	15	4	10	1
4th	11	1	9	1
5th	10	1	9	0
6th	4	1	2	1
2nd–6th total	52	8 (15%)	39	5

upper arm, bulbar cases following arm injection, and certain cases in which there was arm involvement following arm injection but without any possible estimate as to which arm had been injected.

It is apparent from table 4 that of the 33 cases occurring within a month after antigen injection, 19 (58%) were definitely correlated while of the 52 cases occurring 2 to 6 months subsequent to antigen injection only 8 (15%) were correlated. Of the two questionable cases in the first month one showed neck involvement after arm injection, and one had left arm involvement after injection into arm but without record or suspicion as to which arm. Thus at least 19 and possibly 21 of the first-month group could be classified as correlated. The difference between this group and those in the 2 to 6 month group is significant, strongly suggesting that there is a relationship between the site of injection and the localization of paralysis developing within the subsequent month.

This relationship is further borne out by table 5 showing the distribution of paralysis

TABLE 5

PATIENTS WITH PARALYSIS OF CERTAIN LOCATIONS ACCORDING TO DATE OF ONSET AFTER ANTIGEN INJECTION
PATIENTS AGED 0–7 YR.
Minnesota—1946

Mo. Post-immunization	No. of Cases	Arm Paralysis	Leg Paralysis
1st	33	20 (61%)	16 (48%)
2nd	12	3	6
3rd	15	5	8
4th	11	1	7
5th	10	2	5
6th	4	0	1
2nd–6th total	52	11 (21%)	27 (52%)
Immunized before 1946	267	51 (19%)	165 (62%)
Never immunized	95	20 (21%)	57 (60%)

in children under 8 years of age according to history of prior immunization. It will be noted that 20 (61%) of the 33 immunized during the preceding month had an arm involvement, as contrasted with only 11 (21%) of 52 immunized 2 to 6 months preceding. As a further basis for comparison, random samples were drawn for all histories of cases under 8 years of age, divided into those who had been immunized before 1946 and those who had never been immunized. In each case the sample consisted of about one third of the children in each category as determined by the original histories. Table 5 shows that 19% of those who had been immunized before 1946 had arm involvement and 21% of those who had never been immunized. It must be acknowledged that the data in the last two groups are not strictly comparable to those in the first two for they are based solely on the original histories whereas the histories of those cases immunized

TABLE 6

PATIENTS WITH PARALYSIS OF CERTAIN LOCALITIES ACCORDING TO DATE OF ONSET AFTER ANTIGEN INJECTION
PATIENTS UNDER 2 YR. OF AGE
Minnesota—1946

Mo. Post-immunization	No. of Cases	Arm Paralysis	Leg Paralysis
1st	19	14 (74%)	8
2nd	6	1	5
3rd	8	2	6
4th	2	1	1
5th	2	0	1
6th	1	0	1
2nd–6th total	19	4 (21%)	14
Immunized before 1946	15	5 (33%)	12
Never immunized	31	4 (13%)	22

during the six preceding months were verified by checking the hospital records. Such checks showed only rare discrepancies of a minor nature that could not have been sufficient to explain the differences in the results of this table. Furthermore the data of the two groups with a verified history of injection during the preceding six months are strictly comparable. Table 5 shows that those who had received an injection during the month preceding the onset were more likely to have an arm involvement than were other children of comparable age.

Table 5 is, however, open to the criticism that the age distribution of the 33 cases occurring within the first month after immunization was not the same as of the entire group 7 years of age or younger. This is correct as shown in table 12 from which it will be seen that 19 (58%) of the 33 first-month cases were under 2 years of age whereas 19 (37%) of the 52 of the 2 to 6 month group were under 2 years of age. To obviate possible error the cases under 2 years of age have been separately analyzed in table 6. This shows that the difference in distribution of paralysis is even greater in the various groups if limited to the group under 2 years of age.

Several of the British observers, and Martin[1] and Banks and Beale[5] in particular, have commented on the fact that so many of the first-month cases tended to have involvement only of the injected extremity or to show more severe involvement of that extremity

TABLE 7

TYPES OF INFECTION OF POLIOMYELITIS CASES ACCORDING TO IMMUNIZATION HISTORY
AGES 0–7
Minnesota—1946

	Immunized Previous Mo.	Immunized 2–6 Mo. Prior to Onset	Immunized Before 1946	Never Immunized
Bulbar	2	9	57	9
Severe Paralysis	24	22	79	51
Mild Paralysis	7	18	100	22
Nonparalytic	0	3	27	10
Total	33	52	263	92

than of others. Of the 19 correlated first-month cases in this series, seven showed involvement only of the injected extremity. Seven others had frank paralysis of the extremity in question but some weakness in other parts of the body, while five showed definite paralysis in some other part. In at least two of the latter five cases the injected extremity was the most seriously involved; one of the remaining three was fatal and one had involvement of both legs, more serious in the left, but there was uncertainty as to which buttock had received the recent injection. It is apparent from these data that there was a definite tendency toward more severe involvement of the extremity into which the most recent antigen injection had been given.

In view of the apparent concentration of cases during the first month after immunization and the tendency toward localization of the paralysis in the limb into which the latest injection had been given, it is logical to inquire if the resulting paralysis was any more severe than in those immunized more than a month earlier. Table 7 shows the distribution of such cases by type and severity of disease. Bulbar cases are those showing any evidence of involvement of the medulla or cranial nerves. The spinal cases are classified as severe if there was definite paralysis and as mild if there was merely a slight weakness. Nonparalytic cases are those without even demonstrable weakness. The cases

TABLE 8

TYPES OF INFECTION OF POLIOMYELITIS CASES ACCORDING TO IMMUNIZATION HISTORY
UNDER 2 YR. OF AGE
Minnesota—1946

	Immunized Previous Mo.	Immunized 2–6 Mo. Prior to Onset	Immunized Before 1946	Never Immunized
Bulbar	1	0	2	2
Severe Paralysis	17	10	6	21
Mild Paralysis	1	9	7	5
Nonparalytic	0	0	0	3
Total	19	19	15	31

were classified at the time the history was taken—over three years prior to this study. There is thus no element of mental bias conditioned by the current study. Although 24 (73%) of the 33 first-month cases were classed as severe spinal cases as contrasted with 42% of the 2 to 6 month group, the age distribution of the two groups is quite different as shown in table 12. The first-month group may be weighted with more severe cases because of the fact that the younger patients tended to have a more severe form of paralysis throughout the outbreak. To correct for this possible weighting, the group under 2 years of age has been analyzed separately in table 8. Although the figures are small and subject to wide variations due to chance, there is a definite suggestion that the first-month cases were more severe than the 2 to 6 month group. Too great attention cannot be attached to the differences, however, as wide variations exist in the nonimmunized and in those immunized before 1946.

TABLE 9

INTERVAL BETWEEN ANTIGEN INJECTION AND ONSET OF POLIOMYELITIS
Minnesota—1946

Interval in Days	Correlated* Cases	Noncorrelated Cases	Questionable Correlation†
0–4	1	0	0
5–9	3	0	0
10–14	11	5	1
15–19	2	3	0
20–24	1	4	1
25–	1	0	0
Total	19	12	2

* One case having separate injections 2 and 7 days prior to onset classed as a 7 day case and one receiving 10 and 15 days prior classed as a 15 day case.

† Includes one case of involvement of neck muscles after injection of antigen in upper arm and one of left arm and shoulder paralysis following injection into arm (not recalled whether left or right). Incubation periods in these were 20 and 13 days, respectively.

Analysis of the time intervals between last antigen injection and onset of illness in those cases developing during the first month subsequent to injection lends further support to the idea of a causal relationship. Table 9 shows that of the 33 cases, 17 developed in the 10 to 14 day interval and 20 in the 5 to 14 day interval. It further shows that if the cases are divided into those in which the subsequent paralysis involved the extremity into which the last injection had been given (correlated cases) and those in which it involved a different extremity (noncorrelated cases), 11 of the 19 correlated cases developed in the 10 to 14 day interval and 16 of the 19 in the 5 to 19 day period, while the intervals of the noncorrelated cases showed less concentration. This concentration of correlated cases within the usual period of incubation of poliomyelitis further suggests the existence of a relationship between the location of paralysis and the recent antigen injection.

The foregoing observations, showing a difference in the distribution of paralysis among those receiving an antigen injection during the previous month and those not immunized or immunized earlier, and showing likewise a high degree of correlation between the location of paralysis and the site of recently antecedent injections, strongly suggest that a recent antigen injection may be a factor in conditioning the location of

TABLE 10

POLIOMYELITIS CASES DEVELOPING WITHIN 6 MONTHS AFTER IMMUNIZATION BY TYPE OF ANTIGEN LAST RECEIVED

Minnesota—1946

	Developed 1st Mo. Postimmunization		Developed 2–6th Mo. Postimmunization
	Correlated Cases	Noncorrelated* Cases	
Received Antigens Indicated			
Variola	3	3	24
Diphtheria	18	12	33
Pertussis	12	8	14
Tetanus	12	9	22
Did Not Receive Antigens Indicated			
Variola	16	11	28
Diphtheria	1	2	19
Pertussis	7	6	38
Tetanus	7	5	30

* Includes the 2 "questionably correlated" cases. Both of these had had the combined diphtheria-pertussis-tetanus antigen during the preceding month.

TABLE 11

POLIOMYELITIS IN CASES DEVELOPING WITHIN MONTH AFTER IMMUNIZATION BY TYPE OF ANTIGEN RECEIVED IN PREVIOUS MONTH

Minnesota—1946

Monovalent Antigens	Correlated	Noncorrelated‡
Variola	0	1
Diphtheria	3*	0
Pertussis	3*†	0
Tetanus	0	1
Multivalent Antigens		
SD	0	2
DP	2	2
DT	5†	2
DPT	5	6
SDP	1	0
SDT	1	0
SDPT	1	0

* One case had separate injections of diphtheria and pertussis antigens 5 days apart but both within 1 mo. prior to onset. Listed under both headings.

† One case had separate pertussis and diphtheria-tetanus antigens 15 days and 10 days, respectively, prior to onset. Listed under both headings.

‡ Includes the 2 questionably correlated cases, both of whom received DPT.

paralysis if paralysis is to result from the poliomyelitis. The concentration of cases in the first month postimmunization, the possibly greater severity of the cases and the relationship to incubation period further indicate that, as suggested by Hill and Knowelden,[4] an antigen injection may perhaps be a factor in tipping the balance toward paralysis of a case that might otherwise have been nonparalytic. It is logical therefore to inquire as to the factors that may enter into these relationships.

McCloskey,[2] in his report from Australia and Geffen[3] in England, suggested a special relationship to pertussis antigen. Table 10 shows the antigen received by each of the several cases who developed poliomyelitis within six months after immunization. Table 11 shows a more detailed breakdown of the cases receiving antigen during the preceding month. It will be noted that of the 19 correlated first-month cases 16 had not had smallpox vaccine during the preceding month, seven had not had pertussis vaccine, seven

TABLE 12

AGE AND SEX DISTRIBUTION OF POLIOMYELITIS CASES OCCURRING WITHIN 6 MO. AFTER IMMUNIZATION ARRANGED BY MONTH POSTIMMUNIZATION

Minnesota—1946

Age	Month Postimmunization													
	1st		2nd		3rd		4th		5th		6th		Subtotal 2–6th	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Under 1	4	0	0	1	1	1	0	0	0	0	0	0	1	2
1	10	5	4	1	3	3	1	1	0	2	1	0	9	7
2	1	0	1	1	1	0	1	1	1	1	0	0	4	3
3	0	0	0	2	1	0	0	0	0	0	1	1	2	3
4	1	0	0	0	1	0	3	0	1	0	0	0	5	0
5	5	3	1	0	1	1	0	0	1	0	1	0	4	1
6	3	1	1	0	1	0	0	1	1	1	0	0	3	2
7	0	0	0	0	0	1	3	0	0	2	0	0	3	3
Total	24	9	7	5	9	6	8	3	4	6	3	1	31	21

had not had tetanus toxoid and only one had not had diphtheria toxoid. This might suggest that the paralysis was more likely to be associated with the diphtheria toxoid than with any of the other antigens. More probably, however, this apparent relationship is due to the fact that diphtheria toxoid is the most extensively used of the antigens. This latter explanation is supported by study of antigens received by the noncorrelated first-month cases and by cases who had been immunized 2 to 6 months prior. It will be noted that the distribution of antigens received as well as of antigens not received is quite similar for all three groups. The data of these tables does not bear out the suggestion of Burnet and of Geffen[6] that the correlation with prior antigen injections is associated with the pertussis component of a multiple antigen as only nine of the 19 correlated first-month cases had received such an antigen. The data would suggest that the conditioning of the paralysis observed in the month postimmunization was not related to any particular antigen but was rather a nonspecific factor, possibly related to the presence of some irritant, acting as a foreign body. This latter hypothesis is suggested by the fact that so far

as could be learned, all the antigens were alum-precipitated, except in one noncorrelated case developing within one month after smallpox vaccination. Least of all is there any suggestion of incrimination of a living antigen operating in collaboration with the virus of poliomyelitis, as 16 of the 19 correlated cases had not received smallpox vaccine during the preceding month.

All previous reports have suggested that age may be a factor in the development of paralysis among those recently immunized. This is borne out by the data of table 12. Of 33 cases occurring within the first month after immunization, 19 or 58% were under 2 years of age whereas of the 52 cases occurring 2 to 6 months postimmunization 19 or 37% were of this age. The 2 to 6 month group seem to be distributed more or less at random among the first 7 years of age, simulating the distribution of all cases of polio-

TABLE 13

RELATIONSHIP OF PARALYSIS TO PRECEDING INJECTIONS

Minnesota—1946

Month Postimmunization	Poliomyelitis Followed First Injection	Injection Preceding Paralysis Was Not 1st Injection
1st	9	24
2nd	5	7
3rd	3	12
4th	2	9
5th	2	8
6th	1	3
2–6 Total	13	39

myelitis of this age group during the outbreak. The data suggest that the younger children are more apt to have their subsequent reaction to poliomyelitis virus altered by the antigen than are the older children. The sex distribution also suggests a greater tendency among the males than among the females, as 24 (73%) of the 33 first-month cases were males whereas only 31 (60%) of the 52 cases in the 2 to 6 month group were male and 759 (58.3%) of all cases ages 0 to 7 in the outbreak.

Speculation as to the nature of the effect of the antigen in conditioning subsequent paralysis immediately raises a question as to possible sensitization due to prior injections. Table 13 shows an analysis of all cases occurring within six months after antigen injection divided by those whose most recent injection was the first received and those who had received prior immunizing injections. Of the 33 first-month cases nine (27%) were receiving their first injections while of the 2 to 6 month group 13 (25%) out of 52 were receiving their first injection. The similarity of these percentages suggests that the high proportion who had received prior injections was a characteristic of the entire group and not peculiar to those developing paralysis within the ensuing month.

Although the data so far presented suggest that an antigen injection during the month preceding the onset of poliomyelitis may be a factor in determining the development or localization of paralysis, they do not suggest that the effect lasts beyond the initial month. To shed further light on the duration of this effect, an attempt had been made to determine whether there is any difference in the type of reaction to poliomyelitis among those

TABLE 14

PROBABILITY OF BULBAR POLIOMYELITIS ACCORDING TO HISTORY OF PRIOR IMMUNIZATIONS
EXPECTED VS. ACTUAL NUMBER OF BULBAR CASES
Minnesota—1946

Age	Total Cases	Bulb. Cases	% Bulb.	Imm. vs. Diph.			Imm. vs. S.P.			Imm. vs. W.C.			Imm. vs. Tet.			No Immunizations		
				No.	Exp. Bulb.	Act. Bulb.	No.	Exp. Bulb.	Act. Bulb.	No.	Exp. Bulb.	Act. Bulb.	No.	Exp. Bulb.	Act. Bulb.	No.	Exp. Bulb.	Act. Bulb.
Under 1	42	3	7.1	12	.9	0	9	.6	0	11	.8	0	8	.6	0	26	1.8	3
1	167	8	4.8	88	4.2	5	60	2.9	3	62	3.0	4	39	1.9	0	62	3.0	2
2	161	19	11.8	98	11.6	10	82	9.7	9	71	8.4	5	29	3.4	4	51	6.0	7
3	171	21	12.3	121	14.9	15	99	12.2	13	83	10.2	11	32	3.9	3	37	4.6	4
4	211	28	13.3	160	21.3	23	132	17.6	19	88	11.7	11	50	6.7	10	38	5.1	3
5	214	28	13.1	160	21.0	22	141	18.5	22	95	12.4	11	39	5.1	5	39	5.1	4
6	191	49	25.7	160	41.1	40	153	39.3	40	84	21.6	23	41	10.5	9	18	4.6	5
7	141	43	30.5	123	37.5	42	113	34.5	38	67	20.4	26	19	5.8	5	11	3.4	1
8	108	23	21.3	92	19.6	18	90	19.2	18	34	7.2	8	19	4.0	2	10	2.1	2
9	108	26	24.1	85	20.5	20	80	19.3	17	28	6.7	7	24	5.8	3	14	3.4	2
10	89	26	29.2	72	21.0	22	77	22.5	20	28	8.2	12	16	4.7	3	8	2.3	4
11	75	15	20.0	64	12.8	14	58	11.6	11	11	2.2	4	17	3.4	4	8	1.6	1
12	101	27	26.7	89	23.8	23	89	23.8	23	27	7.2	5	11	2.9	2	7	1.9	3
13	100	26	26.0	84	21.8	21	87	22.6	21	25	6.5	5	11	2.9	4	8	2.1	2
14	97	24	24.7	80	19.8	20	84	20.7	21	15	3.7	7	15	3.7	3	10	2.5	2
15	86	13	15.1	62	9.4	10	70	10.6	12	14	2.1	1	15	2.3	4	11	1.7	1
16	69	19	27.5	53	14.6	16	57	15.7	17	8	2.2	1	8	2.2	4	8	2.2	1
17	47	7	14.9	32	4.8	3	37	5.5	4	4	.6	0	3	.4	0	9	1.3	3
18	43	10	23.3	27	6.3	6	33	7.7	7	2	.5	0	5	1.2	1	7	1.6	1
19	31	8	25.8	21	5.4	4	26	6.7	7	0	0.0	0	11	2.8	5	5	1.3	1
20–24	139	37	26.6	86	22.9	27	115	30.6	35	5	1.3	1	51	13.6	19	16	4.3	1
25–29	122	36	29.5	56	16.5	13	95	28.0	27	6	1.8	2	44	13.0	12	14	4.1	3
30–34	71	19	26.8	17	4.6	2	51	13.7	12	0	0.0	0	15	4.0	3	14	3.8	4
35–39	48	14	29.2	15	4.4	6	34	9.9	11	0	0.0	0	10	2.9	4	9	2.6	1
40–	45	10	22.2	10	2.2	2	28	6.2	6	1	.2	0	14	3.1	4	12	2.7	2
Total	2677	539	20.1	1867	382.9	384	1900	409.6	413	769	138.9	144	546	110.8	113	452	75.1	63

who at some time in their lives have had an antigen injection and those who have never been immunized.

For this purpose all the 2709 case histories obtained during the outbreak were examined with respect to history of various types of immunization and types of response to poliomyelitis infection. Cases were classified as described above in connection with the data of tables 7 and 8. On these criteria 539 (19.9%) of all cases in the epidemic were classed as bulbar, 940 (34.7%) as severe spinal, 911 (33.6%) as mild spinal and 292 (10.8%) as nonparalytic. Twenty-six could not be classified due to inadequate data.

In order to determine the possible effect of prior immunization (regardless of date) upon subsequent reactions to poliomyelitis virus infection, the number at each age that might have been expected to be of each type of infection was calculated for those who had received injections of diphtheria, smallpox or pertussis antigen, basing the calculation on the assumption that at each age in each immunization group there would be the same distribution of types of cases as in the total series. A similar calculation was carried out for the nonimmunized cases. The expected results were then compared with the actual number of cases of each type who had received a particular antigen.

A simple example will further clarify the methods of calculation. As shown in table 14 there were 214 children aged 5 years on whom complete histories were obtained. Of these, 28 (13.1%) were classed as bulbar cases. Of the 214, there were 160 who had at some time received injections of diphtheria antigens. If the same percentage of these 160 had been bulbar as among the total series of 214, one would have expected 21.0 cases of bulbar infection among those 5 year olds who had had diphtheria antigens. Actually, 22 of the 160 cases were bulbar. Applying a similar process to each age group as shown in the table, one may obtain the expected number of bulbar cases among all patients who had had diphtheria antigen and compare it with the number of bulbar infections that actually occurred within this group. As shown by table 14, 383 cases would have been expected among those who had ever received diphtheria antigen and 384 actually occurred. By similar processes applied to those receiving other antigens and others who had never received any antigens, it is found that 410 bulbar cases might have been expected among those vaccinated against variola as compared with 413 actually occurring, 139 as compared with 144 among those receiving pertussis antigen, 111 as compared with 113 among those who had received tetanus toxoid and 75 as compared with 63 among those who had never received any antigen. Table 15 shows a summary of similar analyses with

TABLE 15

PROBABILITY OF CERTAIN TYPES OF POLIOMYELITIS AMONG CASES HAVING EVER RECEIVED VARIOUS ANTIGENS, EXPECTED VS. ACTUAL NUMBERS OF CASES AND DEATHS

Minnesota—1946

Antigen Received	Fatal		Bulbar		Severe Spinal		Mild Spinal		Nonparalytic	
	Exp.	Act.	Exp.	Act.	Exp.	Act.	Exp.	Act.	Exp.	Act.
Diphtheria	118	114	383	384	623	604	648	667	214	212
Variola	138	132	410	413	626	608	652	668	212	211
Pertussis	36	30	139	144	271	248	269	292	89	85
Tetanus	39	38	111	113	192	195	186	183	57	55
None	26	22	75	63	184	207	147	132	45	48

TABLE 16

LOCATION OF PARALYSIS AND TYPE OF POLIOMYELITIS INFECTION BY HISTORY OF PRIOR IMMUNIZATION

University of Minnesota Hospital
July–October 1946

	Immunized					Never Immunized				
	Pts.	Arm*	Leg*	Bulbar	NP	Pts.	Arm*	Leg*	Bulbar	NP
0–4	53	9	30	2	3	34	5	21	5	1
5–9	68	7	22	18	5	13	2	8	0	2
10–14	49	8	20	11	4	7	1	3	2	1
15–16	13	1	6	0	0	2	1	0	1	0
	183	25	78	34	12	56	9	32	8	4

* A child having both leg and arm involvement is counted in both groups.

respect to the severe spinal, mild spinal, nonparalytic and fatal cases. The fatal cases are also included in the appropriate other tables (bulbar and severe spinal) according to their classification. The 33 patients who had received the antigens during the month preceding onset have not been excluded from these tables as they constitute too small a fraction of the total to alter the results.

None of the differences shown in these several tables is statistically significant, nor is there any apparent trend of small differences. Thus while there was a slightly smaller number of bulbar and fatal cases among the nonimmunized than might have been anticipated, this is offset by a larger number of severe spinal infections. The tables show clearly that in this entire group, when corrected for differences in age, there was no difference in the reaction of those who had received various antigens, and those who had never received any antigens. Thus whatever effect the antigens may have had in conditioning paralysis during the first succeeding month is apparently not permanent. There is hence no reason to withhold immunization in the fear that it will cause the individual to respond badly to poliomyelitis when exposed in subsequent years, or even after the month immediately following the injection.

Further evidence of a lack of difference in response of the immunized and nonimmunized groups is found in analysis of the cases of poliomyelitis in the University of Minnesota Hospital during July through October, 1946. Of 239 case records that were complete as to immunization history, 183 had at some time in their lives received some antigen and 50 had not. It will be noted from table 16 that the proportions of bulbar and of nonparalytic cases were the same in each group, as was also the distribution of paralyses between arm and leg.

It will be objected that the foregoing data deal only with the type of response to poliomyelitis virus and do not shed any light on altered susceptibility to recognizable infection. In other words, may a child who had previously been immunized in some earlier year be more or less likely to develop poliomyelitis?

To obtain an answer to this question, all cases of poliomyelitis on the pediatric service of the University of Minnesota Hospital during July, August, September and October, 1946 were compared as to immunization history with nonpoliomyelitis cases on the same

TABLE 17

DIPHTHERIA IMMUNIZATION HISTORY OF ALL PATIENTS ON PEDIATRIC SERVICE
UNIVERSITY OF MINNESOTA HOSPITALS, JULY–OCTOBER, 1946

Actual Number with History of Diphtheria Immunizations Compared with Expected Number Based on Whole Group

Age	Polio Cases			Nonpolio Cases			Total Cases with Record	Diphtheria Immunization					
	Total	No Rec.	Cases with Rec.	Total	No Rec.	Cases with Rec.		Polio Cases	Nonpol. Cases	Total Imm.	% Imm.	Expected Immun.	
												Polio Cases	Nonpol. Cases
Under 1	7	2	5	43	1	42	47	0	1	1	2.1	.1	.9
1	26	7	19	18	5	13	32	9	7	16	50.0	9.5	6.5
2	34	16	18	9	4	5	23	8	1	9	39.1	7.0	2.0
3	41	20	21	14	2	12	33	14	6	20	60.6	12.7	7.3
4	40	18	22	5	0	5	27	11	4	15	55.6	12.2	2.8
5	34	17	17	16	6	10	27	10	5	15	55.6	9.5	5.6
6	42	18	24	9	2	7	31	20	5	25	80.6	19.3	5.6
7	41	19	22	9	3	6	28	18	6	24	85.7	18.9	5.1
8	27	16	11	6	2	4	15	11	4	15	100.0	11.0	4.0
9	17	9	8	4	2	2	10	6	0	6	60.0	4.8	1.2
10	19	7	12	8	5	3	15	9	3	12	80.0	9.6	2.4
11	18	10	8	6	3	3	11	4	2	6	54.5	4.4	1.6
12	23	12	11	7	1	6	17	11	6	17	100.0	11.0	6.0
13	27	11	16	9	0	9	25	9	7	16	64.0	10.2	5.8
14	18	8	10	5	3	2	12	8	1	9	75.0	7.5	1.5
15	23	9	14	11	1	10	24	11	5	16	66.7	9.3	6.7
16	1	0	1	3	3	0	1	1	0	1	100.0	1.0	0.0
Total	438	199	239	182	43	139	378	160	63	223	59.0	158.0	65.0

service during the same period of time. Using the same statistical methods outlined above, the total number of patients who had received each antigen as well as those who had received no antigen was determined and the probable number of poliomyelitis cases in each group compared with the actual number. An example further illustrates the method of calculation (table 17). Of 34 poliomyelitis patients aged 5, only 17 had complete histories; the remaining 17 had no record as to whether the patient had or had not been immunized. Similarly only 10 of the 16 histories of nonpoliomyelitis cases in 5 year olds were complete, making a total of 27 usable histories for this year of age. Of these 27 patients 15 had been immunized against diphtheria or 55.6% (10 had poliomyelitis and 5 did not). If this percentage had held for the 17 poliomyelitis cases with usable records, one would have expected 9.5 to have had a history of diphtheria immunization and 5.6 among the 10 nonpoliomyelitis cases. Actually there were 10 cases and 5 cases, respectively.

TABLE 18

IMMUNIZATION HISTORIES OF ALL PATIENTS IN PEDIATRIC SERVICE, UNIVERSITY OF MINNESOTA HOSPITALS, JULY–OCTOBER 1946

Number with History of Immunizations with Various Antigens Compared with Expected Number Based on Whole Group

Antigen Received	Poliomyelitis Cases		Nonpoliomyelitis Cases	
	Expected	Actual	Expected	Actual
Diphtheria	158	160	65	63
Variola	147	146	60	61
Pertussis	77	75	28	24
None	60	56	65	69

Applying this same procedure year by year throughout the group in the pediatric service yielded a total of 158 poliomyelitis patients that might have been expected to have had injections of diphtheria antigens as compared with 160 who actually had such a history. Among the nonpoliomyelitis cases there were 65 expected cases and 63 actual.

Table 18 summarizes the results of similar comparison of the two groups with respect to other antigens. On the same basis, among the poliomyelitis patients one might have expected 147 to have been vaccinated against variola as compared with 146 actual cases, 77 as compared with 75 immunized against pertussis, and 60 as compared with 56 to have had no antigen whatsoever. For the nonpoliomyelitis patients the expected number vaccinated against variola was 60 as compared with 61 actual, 28 immunized against pertussis as compared with 24 actual and 65 expected to have no antigens as compared with 69 actual. Here also none of the differences is statistically significant. The comparisons show clearly that for these two groups of patients the pattern of prior immunizations was identical when corrected for differences in age. There is, therefore, no evidence from these cases that poliomyelitis is any more or any less likely to attack the immunized child as contrasted with the nonimmunized.

DISCUSSION

In spite of the magnitude of the outbreak of which the cases here recorded were a part, the number of cases that occurred among recently immunized children is small. There is no way to determine how many children of various ages were immunized against various

diseases during the spring and summer of 1946, but it was obviously very large. Lacking such data one cannot determine precisely whether the attack rate of poliomyelitis was or was not higher among those recently immunized than among those who had not recently received an antigen injection. Few of either group would be expected to develop recognizable poliomyelitis. No importance can therefore be attached to the absolute magnitude of the figures here recorded. It must be recalled, however, that the cases here described occurred during a period of unusual prevalence, when almost 3,000 cases and 216 resident deaths were recorded in a state of barely 3,000,000 population.

Some significance must, however, be attached to the fact that the number of patients who had been immunized during the month prior to onset was appreciably larger than the number of those immunized in any one of the other recently preceding months. Even this observation might be dismissed as due to chance were it not for the fact that these first-month cases differed in character from those earlier immunized or those never immunized. The different pattern of paralysis and the correlation with the site of prior inoculation are strongly suggestive of some relationship to the antigen injection. Moreover we cannot overlook the fact that these data are in exact harmony with the several reports from the British literature. Considerable attention must be attached to the fact of uniformity of results in a series of independent observations even though each may be small. The conclusion seems inescapable that in a few cases the location of the paralysis occasioned by the virus of poliomyelitis is conditioned by recent antigen injections and there is at least some suspicion that such injections may be a factor determining the difference between a recognizable paralytic infection and an unrecognizable nonparalytic involvement.

Of even greater importance is the question of the duration of this effect. If it is merely transient, its influence can be avoided through more careful selection of the time for immunization, which is almost invariably an elective procedure. Postponement of immunization during the periods when poliomyelitis is prevalent will avoid any possibility of its conditioning an unfavorable response to the infection. On the other hand if the effect is lasting there would be reasons for re-evaluating the basic concept of immunization programs. On this latter point the data here presented seem even more definite than with respect to the influence during the first month. The data indicate clearly that the responses of those who had been immunized more than a month earlier were no more severe than among those who had never been immunized. In fact whatever differences may exist might even be interpreted as suggesting that, apart from the first month postimmunization, the immunized group responds slightly better than does the non-immunized as shown by the lower proportion of severe paralytic cases in the 2 to 6 month group and in those immunized prior to 1946 (tables 7 and 8). Far more evidence would be required before this latter would be advanced beyond the stage of a mere suggestion. It is clearly apparent, however, that there is nothing in the data reported here or elsewhere which can be interpreted as even suggestive of a permanent poliomyelitis hazard associated with immunization with any of the antigens here considered.

Conclusion

In poliomyelitis patients who have received some antigen during the month prior to onset there is a high degree of correlation between site of paralysis and site of injection. Such cases tend to show a different distribution of paralysis and a more severe paralysis than do comparable children immunized 2 to 6 months previously, immunized in previous years or never immunized.

The time interval between date of injection and onset of illness suggests some relationship other than chance. There is no evidence that this relationship is associated with any one antigen. There is no evidence that the influence of the antigen persists, or in any way conditions the response to poliomyelitis virus for longer than one month.

Since immunization is an elective procedure, it can well be delayed during outbreaks of poliomyelitis; but there is no suggestion that the postponement should be more than temporary.

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REFERENCES

1. Martin, J. K., Local paralysis in children after injections, Arch. Dis. Childhood **50**:1, 1950.
2. McCloskey, B. P., Relation of prophylactic inoculations to onset of poliomyelitis, Lancet **1**:659, 1950.
3. Geffen, D. H., Incidence of paralysis occurring in London children within four weeks after immunisation, M. Officer **83**:137, 1950.
4. Hill, A. B., and Knowelden, J., Inoculation and poliomyelitis, Brit. M. J. **2**:1, 1950.
5. Banks, H. S., and Beale, A. J., Poliomyelitis and immunization against whooping-cough and diphtheria, Brit. M. J. **2**:251, 1950.
6. Discussion on Poliomyelitis following inoculations, Section of Epidemiology and State Medicine, Proc. Roy. Soc. Med. **43**:775, 1950.

GENERAL REFERENCES

MacCallum, F. O., Clinical poliomyelitis in association with peripheral inoculation of prophylactics, Brit. M. J. **2**:6, 1950.

Leake, J. P., Anterior poliomyelitis and pertussis and diphtheria immunization, J.A.M.A. **144**:259, 1950.

SPANISH ABSTRACT

Incidencia de Poliomielitis Siguiente a la Inyección de Antigenos

En vista de reportes publicados en la literatura médica inglesa concerniente la posible relación entre el sitio de administración de inyecciones recientes de antigenos y la localización de la paralisis en la poliomielitis, los autores realizaron un estudio epidemiologico detallado de todos los casos de poliomielitis ocurridos durante la epidemia de 1946 en Minnesota. Se encontró que en el grupo de niños menores de ocho años de edad, 85 de ellos tenian una historia antecedente de haber recibido inyecciones de antigenos durante los seís meses anteriores al desarrollo de la enfermedad; y de este grupo, 33 pacientes tenian historia de haber recibido una inyección durante el mes anterior. Formas paraliticas del brazo fueron mas frecuentes entre el grupo de pacientes inmunizados durante el mes anterior, que en aquellos otros inmunizados mas lejanamente (2-6 meses), ó que en el grupo inmunizado antes del año 1946, ó en los nunca inmunizados. Igualmente, la severidad y extensión de la paralisis fué mayor en la extremidad inyectada con el antigeno. Contrariamente a la experiencia inglesa y australiana, la cual incrimina a la vacuna de la tosferina como factor etiologico, en este estudio no se demonstró ninguna relacion aparente entre el tipo de antigenos usados y la ocurrencia de la enfermedad. Tampoco, se pudo demonstrar que este efecto del antigeno en alterar la reaccion del cuerpo a el virus de la poliomielitis, fuera de ocurrencia frecuente, ó persistiera por mas de un mes. Finalmente, los autores sugieren posponer temporariamente las inmunizaciones durante epidemias de poliomielitis, ya que su efecto sobre el virus es solo temporario.

University of Minnesota Medical School

GALACTOSEMIA AND ITS RELATION TO LAENNEC'S CIRRHOSIS

Review of the Literature and Presentation of Six Additional Cases

By EDWARD H. TOWNSEND, JR.,* M.D., HOWARD H. MASON, M.D., AND PAUL S. STRONG, M.D.
New York City

GALACTOSEMIA, or "galactose diabetes," is a specific metabolic deficiency capable of profound effects on growth, development and well being. These effects are related to the amount and duration of galactose consumption and largely reversible by removal of galactose from the diet. It is a deficiency which may become less severe as the individual matures but from which he never fully escapes. The essential features of the illness are feeding difficulties dating from the neonatal period, malnutrition, hepatomegaly, galactosuria, mental deficiency and not infrequently nuclear cataracts.

Abnormal galactose tolerance tests are found in other disorders such as liver disease[1-4] and hyperthyroidism;[5-7] but "galactosemia," in contrast to these disorders, exhibits intolerance to galactose as the only permanent metabolic defect.

The records of Babies Hospital revealed six cases of galactosemia which form the basis of this report.

REVIEW OF THE LITERATURE

The first case of galactosemia was reported in 1908 by von Reuss.[8] An 8 month old infant who weighed only 1200 gm. manifested malnutrition, hepatomegaly and melituria. This melituria disappeared with the elimination of milk from the diet, but the infant died before further tests could be performed; at necropsy the liver was found to be cirrhotic. Von Reuss did not believe any conclusions could be drawn from this fact, since the infant had received cognac daily since birth.

Göppert,[9] in 1917, reported the existence of the disorder in a child 4 years of age whose liver had been large since the neonatal period and who was jaundiced from the first week of life to the ninth month. Her symptoms were typical of galactosemia, and the melituria she had exhibited cleared upon withdrawal of galactose from the diet. This child had three siblings. One at the age of 6 years was a delicate but otherwise healthy child, and two died in infancy after a stormy illness of which jaundice was one feature, with pathologic findings of pyelitis and nephritis. Whether all four had galactosemia is uncertain, but Göppert's case is frequently cited as the first instance of familial galactosemia.

Fanconi, in 1933,[10] reported the case of a boy 9 years of age suffering from neurofibromatosis who showed galactosuria and a marked rise of the total blood sugar after the ingestion of galactose but with no hepatomegaly and only slight underdevelopment. Eleven siblings were free of any clinical manifestations of galactosemia.

From Babies Hospital and the Department of Pediatrics, Columbia University College of Physicians and Surgeons, New York City.

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* Present address: 26 South Goodman Street, Rochester, N.Y.

Unshelm,[11] in 1934, reported the case of an infant with galactosemia and marked hepatomegaly, both of which were corrected soon after the infant was placed on a galactose-free regimen.

Mason and Turner,[12] in 1935, reported the first case in the American literature. The patient was a Negro boy who, when first seen at 6 months of age, showed malnutrition, hepatosplenomegaly, galactosuria, albuminuria and evidence of hepatic dysfunction. Cataracts were discovered later. He is Case 6, T. B., of this report and his subsequent course is presented below.

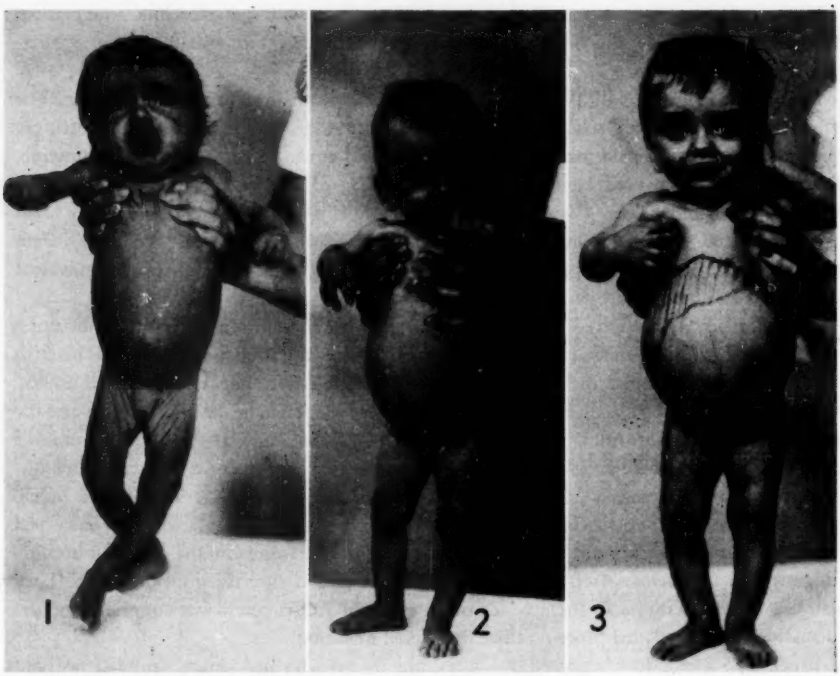
Norman and Fashena,[13] in 1943, reported the case of an 11 week old male infant with galactosemia and evidence of liver dysfunction which disappeared upon removal of galactose from the diet.

Mellinkoff et al.[14] reported the case of an infant who, in addition to feeding difficulties, had jaundice without anemia of more than two weeks' duration beginning on the fifth day of life. He presented the physical picture of malnutrition, hepatomegaly and ascites. His urine contained galactose and albumin. "It was assumed he had lactosuria, and he was sent home on a formula of powdered milk," only to return at the age of 2 months with evidence of severe hepatic damage and dysfunction in the form of ascites and distended abdominal veins, a positive cephalin flocculation test and elevated icteric index. All the evidence of hepatic dysfunction with the exception of the galactose tolerance test returned to normal within one month of withdrawal of galactose from the diet. The authors suggested that galactose itself is stored in the liver and is directly injurious to it. They also felt that proteinuria in the absence of an elevated Addis count was suggestive of the formation of an abnormal protein rather than renal irritation.

Bruck and Rapoport[15] reported a 7 week old infant who had severe jaundice without anemia beginning on the fifth day of life and lasting three weeks. The infant was brought to the hospital because of feeding difficulties and diarrhea since birth which could not be relieved by varying formulas, all containing galactose in varying amounts. Physical examination showed malnutrition, hepatomegaly, nuclear cataracts (which subsequently disappeared when the infant was placed on a galactose-free regimen) and a dry rough skin. Chemical determination revealed hypoproteinemia, elevated serum phosphatase and an abnormal galactose tolerance test. The cephalin flocculation test was negative. The urine showed albumin and galactose. During the performance of the galactose tolerance test, 25% of the ingested galactose was recovered from the urine. Galactose was demonstrated to diffuse into the various compartments of the body including the spinal fluid. The authors studied the relationship of galactose and glucose in several ways, demonstrating the competitive intestinal absorption which is evident in all cases and, in addition, the diminution of galactose intolerance caused by the infusion of glucose into patients with hypergalactosemia. Thus, galactose and glucose seem to be in competition for the same enzyme system which presumably resides in the liver.

Goldbloom and Brickman[16] in 1946 reported two cases with typical clinical history and physical findings. The lamellar cataracts persisted for six years in one case and for several months in the second, though in the latter they showed some signs of clearing. Mental retardation was severe in the first patient, who had shown severe "physiological" jaundice of three weeks' duration and who had received galactose for the first six months of life, but was absent in the second who had received galactose for only three months.

The patient of Goldstein and Ennis[17] showed an elevated thymol turbidity as evidence of hepatic damage, but this case is unusual in that even after four months of galactose-



FIGS. 1-3. Case 1, N. P. 1. On admission at 6 mo. of age. 2. At age 8 mo. 3. At 14 mo. of age, 2 mo. after unintentional break in her diet. Hepatosplenomegaly is shown by shaded areas.

free regimen the liver remained considerably enlarged though the cataracts had cleared.

Greenman and Rathbun[18] presented a case with characteristic clinical course and findings and concentrated on study of the results in intravenous galactose tolerance tests. They found that the intolerance to galactose could be reduced significantly by the simultaneous administration of glucose, confirming the observation of Bruck and Rapport,[15] suggesting to them that in addition to the elimination of galactose from the diet the addition of glucose might be advantageous to patients with galactose diabetes.

Bell et al.[19] presented two siblings whose hepatic changes as evaluated microscopically consisted mainly of fatty infiltration similar to the pathologic findings in livers of patients suffering from diabetes or alcoholism. The authors postulated that infiltration with fat is the basic cause of hepatic enlargement and dysfunction in this disease. The siblings were presumed to suffer from the same disease since the autopsy findings in the liver of the older showed the same microscopic features as the liver biopsy of the younger, who upon investigation showed galactose intolerance. The older infant had died at the eighth day of life after a severe illness with icterus and hemorrhages. In addition to fatty infiltration, the liver showed areas of focal necrosis.

It may be added, finally, that galactosemia is not as rare as the literature would imply, for there are many unreported cases that one hears discussed in various pediatric centers. The authors know of at least four such cases which have been presented locally in seminars or postgraduate courses. Nine proved cases have been summarized above and this report adds five, making a total of 14 reported cases.

Case Reports

Case 1: N. P., a female infant, was first seen at the age of 6 mo. with the chief complaints of failure to gain weight and abdominal enlargement of 4 mo.' duration.

The father, aged 30 yr., was suffering from hypertensive cardiovascular disease. The mother, aged 22, was well. An older sibling, who had died at the age of 2 mo. of an acute respiratory illness, showed at necropsy multiple pulmonary abscesses and bilateral bronchopneumonia. Random urinalyses during this infant's hospitalization failed to show melituria.

The patient was the product of an uneventful pregnancy and was delivered at term by low forceps. The birth weight was 2720 gm. The neonatal period was uneventful.

She was initially breast fed but this was discontinued during the fourth week and an evaporated milk formula prescribed. She appeared to do well and at the age of 1 mo. she weighed 3800 gm. At the age of 6 wk., an aunt commented on the size of the abdomen and for this reason the infant was taken to her physician who instituted the first of several formula changes; in spite of this, the abdomen remained noticeably enlarged and, in addition, the infant became listless and began to lose weight. All formula changes over the next 3 mo. had in common the inclusion of galactose in 1 or more of the ingredients. There was no vomiting or diarrhea accompanying the 800 gm. weight loss over these 3 mo.

During the 3 wk. prior to admission to Babies Hospital, the infant suffered 2 bouts of fever not clearly explained, though she was noticed to have considerable respiratory distress aggravated by sitting up, and on occasions she required oxygen for its relief. She was given a 2 wk.' course of penicillin without improvement and then entered Babies Hospital.

On physical examination she was a poorly developed, poorly nourished infant, as shown in Fig. 1. She weighed 3100 gm. and was 55 cm. tall. Her head circumference was 37 cm., that of her chest 32 cm. and of her abdomen 37 cm. She lay in bed with little inclination to spontaneous activity. She could neither roll over nor sit up. When placed in a sitting position, she suffered respiratory embarrassment due to encroachment of the abdominal contents on the thorax. Her skin was rough, thick and scaly (similar to that described in the patient of Bruck and Rapoport), with obvious loss of

TABLE 1

Values for Chemical Constituents in Blood Serum, Case 1

	1st Adm.	2nd Adm.	3rd Adm.	July 1947	July 1950
	July 1946	Sept. 1946	Dec. 1946		
Serum					
Albumin	3.6	4.0	4.3	4.6	4.4
Globulin	1.9	1.9	2.8	2.3	2.8
Cholesterol	106	98	170	155	96
Bilirubin	0.43	0.30			
Calcium	9.5	10.5			
Phosphorus		5.0			
Phosphatase		9.1			
Plasma					
NPN	27.6	29.6	30		
Urea N	16.4	10.7			
Urea Ratio	60.5	36.2			
Other Tests					
Prothrombin Index	1.1	0.89			
Cephalin Flocculation	++++	0	+++	0	0
Bromsulfalein					
5 min.	35%	20%	65%		
30 min.	5%	0%	20%		
Phenol Turbidity					5.4
Zinc Turbidity					5.3

subcutaneous fat, most evident in the multiplication and accentuation of the gluteal folds. The eyes revealed diffuse lenticular cataracts. Respiratory movements were thoracic in type. The lungs were clear. The heart was normal. The abdomen was markedly protuberant and thin-walled, due to the paucity of the subcutaneous fat, so that the venous pattern seemed exaggerated. The liver was enlarged to 7 cm. below the costal margin. It was smooth in outline, firm in consistency and not tender. The spleen was 2 cm. below the costal margin. No other abdominal organs or masses were palpable. There was no evidence of ascites. Extremities were thin, poor in subcutaneous fat and muscle mass.

The laboratory findings for this and subsequent admissions are partly listed in table 1. On this

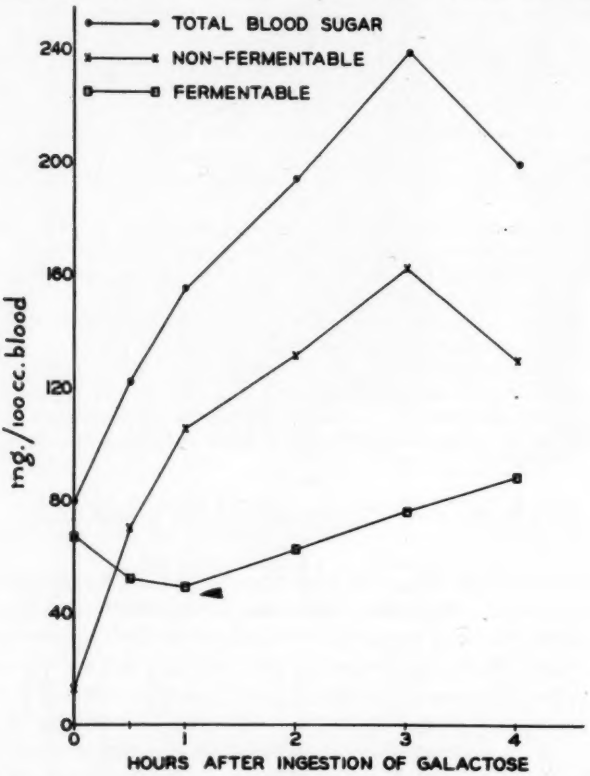


CHART 1. Oral galactose tolerance test performed during initial admission, using as test dose 1.75 gm. of galactose/kg. body wt.

admission, the findings were chiefly melituria and those of hepatic irritation. The Kline and Mantoux tests were negative. Nose, throat and stool cultures showed no pathogens; blood culture was sterile. Roentgenograms of the hands and forearms showed all structures to be hypoplastic but skeletal maturation was within normal limits. Intravenous pyelography revealed the kidneys to be normal in outline and the dye to be excreted in good concentration. By the Gesell developmental scale the infant was scored as low normal, but the examiner was favorably impressed by her score considering her physical examination.

The sugar in the urine was found to be completely nonfermentable when incubated with yeast at 37° C. for 24 hr. Galactosemia was suspected. The galactose tolerance test (chart 1) showed the characteristic intolerance to that sugar. The glucose and levulose tolerance tests were normal. The response of the blood sugar to the injection of adrenalin was normal. The melituria cleared within 24 hr. of removal of galactose (i. e., as lactose) from the diet and the albuminuria within 7 days only to reappear when galactose was reintroduced into the diet.

Aside from a markedly positive cephalin flocculation test, there was no evidence of impairment of liver function other than the inability of the infant to metabolize galactose.

She was discharged after 1 mo. on a galactose-free regimen.* The only change in her physical condition at the time of discharge was the disappearance of the episodes of respiratory distress. She returned to the clinic a month later weighing 4800 gm., a gain of 800 gm. She was more active than at any time previously, seemed healthier, and had "filled out" with the acquisition of more subcutane-

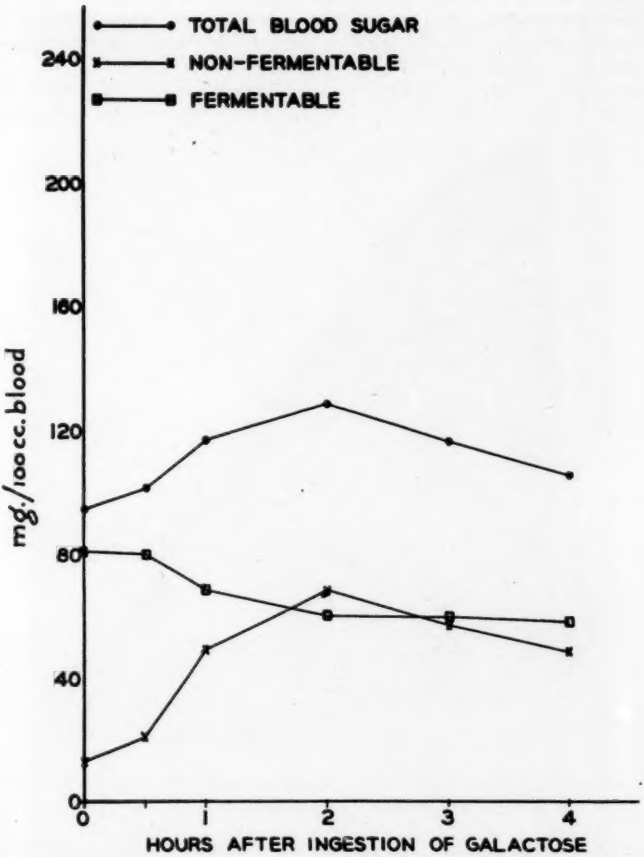


CHART 2. Galactose tolerance test performed at 13 mo. of age. Test dose at this time was 0.5 gm./kg. body weight.

ous fat and greater muscle mass as shown in figure 2. The liver extended 4 cm. below the costal margin. The spleen was not felt. Ten days later, she was readmitted to the hospital for an upper respiratory infection associated with vomiting and diarrhea. She recovered uneventfully, and chemical examinations made during this admission are of interest because the cephalin flocculation test had reverted to negative. A galactose tolerance test showed persistence of intolerance to that sugar.

*Such a regimen centers about the elimination of all milk and milk products. A soy-bean milk substitute (Mull-Soy) has been used by the authors with considerable success. The mothers have been able to make cake, cookies and even ice cream with this preparation as a milk substitute. Some infants cannot tolerate soy-bean milk substitutes, in which case a compounded formulae based on casein-hydrolysates (Nutramigen) as the milk substitute has been employed.

At the age of 1 yr. ophthalmologic examination showed persistence of the nuclear and peripheral opacities in both lenses.

During the next month the infant did not do well. An unintentional break in her diet was discovered when a urine specimen showed melituria and the cephalin flocculation test became positive. The addition to the diet of an Italian bread reputed to contain no "milk sugar" had been the only change. The mere removal of this item resulted in disappearance of the melituria. Her symptoms at this time were irritability, anorexia, failure to gain weight and hepatomegaly. On physical examination she showed malnutrition; the liver was 7 cm. below the costal margin and the spleen 4 cm. (Fig. 3). The chemical findings in table 1 are of interest in that in addition to the positive cephalin flocculation test, there was significant retention of bromsulfalein.

The galactose tolerance test performed at this time differed from the others in that only 0.5 gm./kg. body weight was given as the test dose. This was done in the hope that she would show some

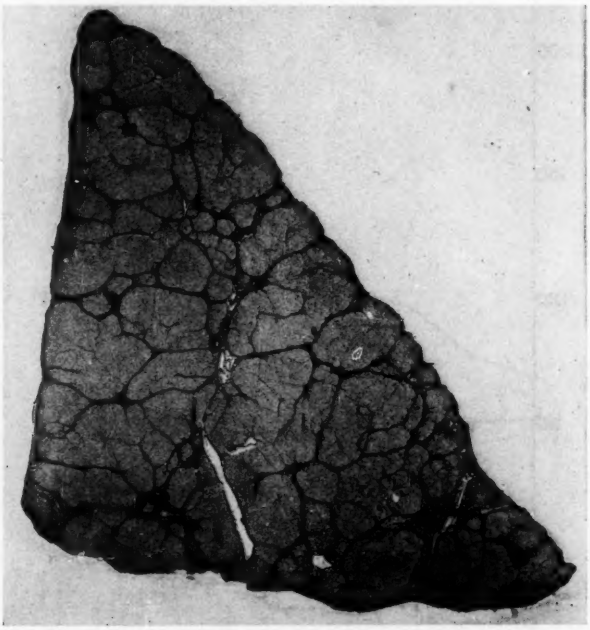


FIG. 4. Gross microscopic appearance of liver biopsy showing increased fibrous tissue in portal areas and interlobular septa.

increased tolerance to the sugar at a range more compatible with her normal daily intake. Chart 2 shows that even this small dose produced a curve which, though less abnormal than the previous one, was far above normal limits for the test.

A liver biopsy was obtained at this time. The surgeon described the liver as "having the appearance typical of cirrhosis." The surface was firm, had a cobblestone appearance, and on cutting presented a fibrous and gritty resistance to the knife.

Microscopic examination (Figs. 4 and 5) confirmed this impression. The hepatic cells presented a granular appearance throughout, suggesting to one pathologist the picture seen in livers of patients who had received intravenous sucrose. There was no vacuolation within the hepatic cells. A diffuse increase in connective tissue was found throughout the lobules, most obvious in the portal areas, and the bands of fibrous tissue extending from portal area to portal area served to define the lobules. This scar tissue was widely infiltrated with lymphocytes and a few polymorphonuclear leukocytes. Chemical analysis of the fat content revealed a normal value of 4.3% of the wet weight.

The patient was seen again at 18 mo. of age. She had been slow to develop and was just beginning to walk with support. Physical examination at the time was substantially normal. Her height and weight had become normal. Normal values for blood chemistry are shown in table 1.

Three years later, at 4½ yr. of age, her progress had apparently been uneventful. She had been maintained on a galactose-free regimen. The chemical data are shown in table 1. An eye examination showed persistence of minimal lenticular opacities, differing only slightly from the findings on her

FIG. 5. Photomicrograph of liver biopsy specimen showing increase in fibrosis of portal areas and granular cytoplasm without vacuolization of hepatic cells.

initial examination 4 yr. previously. A psychometric examination by the Stanford-Binet method showed an I.Q. of 87, low average mentality.

This case is unusual in that it exemplifies the reappearance of the full-blown picture of galactosemia after an apparent remission and the finding of cirrhosis of the liver in the patient at this time. This is the second case with true Laennec's cirrhosis to be recorded. The fluctuations in the size of the liver coincident with the break in the diet and the absence of any other known cause for cirrhosis make it probable that cirrhosis was caused by persistence of a high level of galactose in the blood.

The following 3 cases are reports of members of a single family, demonstrating the existence of

the illness in siblings. This possibility has been inferred twice before (4 and 13), but the family recorded below is the first which supplies proof on this point.

Case 2: J. F., a female infant, was admitted to Babies Hospital at the age of 6 wk., with the chief complaint of vomiting of 2 wk.' duration and feeding difficulties since birth. The mother and father were both living and well. There were no older siblings. A previous pregnancy had ended in miscarriage at the fifth month of gestation, the cause for which was not evident.

J. F. was born at term and was delivered by cesarian section because of the placenta praevia. The pregnancy had been complicated during the first trimester by hyperemesis, as a consequence of which the mother's diet was inadequate. She lost 10.0 kg. during this period. The last 2 trimesters were uneventful and the dietary history during those months showed no indiscretions or deficiencies. The birth weight was 3200 gm. The neonatal period was uneventful except as relates to the present illness. There was no jaundice, cyanosis or convulsions. She was given an evaporated milk formula which she tolerated well at the time. On discharge at the age of 14 days, her weight was 2900 gm.

At home she gained weight slowly and during the subsequent month she took only 56 gm. of her feedings 7 times a day. Two weeks prior to hospitalization she began to vomit irregularly without apparent relation to the amount, type or technic of feeding. She weighed only 3400 gm. at the age of 6 wk.

Physical examination at the time of her first admission revealed a fairly well developed, slightly undernourished female infant who was alert and did not appear ill. The measurements of her length and circumference were normal. No cataracts were seen. The abdomen was soft but protuberant because of a large liver which was found to extend 5 cm. below the costal margin. It was smooth in outline, firm in consistency and not tender. The spleen was felt at the costal margin. The remainder of the physical examination was entirely normal.

Laboratory examinations showed a normocytic, hypochromic anemia of mild degree. WBC count was normal in total and in differential. Repeated examinations of random urine specimens showed sugar and albumin with negative microscopic findings on examination of sediment. By fermentation, osazone and optical rotation tests the urine sugar was identified as galactose. There were no abnormal blood chemical findings. A cephalin flocculation test was not done. The glucose and levulose tolerance tests were normal. The galactose tolerance curve showed a grossly abnormal pattern.

The grossly abnormal galactose tolerance test and the disappearance of the melituria and albuminuria upon withdrawal of galactose from the diet confirmed the diagnosis of galactosemia and she was placed on a soy-bean (galactose-free) formula. She seemed to do well on this formula. There was no more vomiting and she took adequate amounts of the formula to satisfy caloric needs.

For 6 yr. she was maintained rigidly on a galactose-free regimen. In fact the child rapidly developed a distaste for milk and milk-products which has lasted to this day. She suffered numerous upper respiratory illnesses, but none was particularly severe. She received her immunizations at accepted times. The only noteworthy fact during this entire period was that she did not gain weight in the "normal range" until her fifth year of life, in spite of what the mother described as a "prodigious appetite." She developed normally as far as sitting, standing and related accomplishments are concerned.

She was admitted for re-evaluation of her galactosemia at approximately 6 yr. of age. She had no complaints and her physical examination was normal. Psychometric examination by the Stanford-Binet method showed her to be a dull-normal, possessing an I.Q. of 85. On the Goodenough drawing test she rated only as high as 4 yr., 6 mo.

Laboratory tests failed to reveal any abnormalities, or any evidence of liver damage or dysfunction, with the exception of a grossly abnormal galactose tolerance test. During the performance of the galactose tolerance test the child excreted 15.6 gm. of galactose in the urine. This represented 50% of the ingested galactose, a figure somewhat higher than any of the authors' other cases or those reported in the literature.

She was hospitalized again at the age of 8½ yr., for tonsillectomy and adenoidectomy. There was a considerable amount of pubic hair without other evidence of sexual maturation. Again the blood tests were all normal, revealing no evidence of hepatic or other organic disturbance. The galactose tolerance test was not repeated.

She has subsequently remained mentally below average, having difficulty in her school work, so that she has been unable to keep up with her coevals and has had to be assigned to a special class.

Case 3: T. F. is the younger brother of J. F. He was born by spontaneous delivery after a difficult pregnancy characterized by hyperemesis gravidarum during the entire period of gestation. This was resistant to all therapy and during her entire pregnancy the mother gained only 1000 gm. The boy weighed 3200 gm. at birth.

Because of galactosemia in the older sibling, the patient's urine was analyzed shortly after he had been started on a standard evaporated milk formula and was found to contain a sugar that was nonfermentable when incubated with brewer's yeast and, therefore, presumed to be galactose. A galactose-free diet was prescribed and the melituria ceased within 24 hr. There had been no albuminuria. Except for jaundice without anemia on the second day of life, neonatal course was uneventful.

On the 27th day of life, hospitalization was necessary because of an abscess of the right foot with regional lymphangitis and lymphadenitis. This was found to be due to Staph. aureus hemolyticus; therapy with aqueous penicillin resulted in rapid resolution of the infection. During this admission, however, chemical tests and urinalyses were all normal, except the galactose tolerance test which was grossly abnormal. A soybean (galactose-free) formula caused diarrhea; hence he was shifted to a nutramigen-casec® formula which he seemed to tolerate better.

He left the hospital at the age of 2 mo. weighing 3600 gm. He was seen at monthly intervals and remained on a rigid galactose-free regimen. His weight gain, through progressive, constantly put him below the 75 percentile for his age and height. His teeth were slow to erupt but were normal in appearance. Developmental progress was slow; at 18 mo. he could not stand unless supported.

At the age of 20 mo., he was admitted for re-evaluation of the status of his galactosemia. Physical examination at the time revealed the child to be thin but well-developed physically. He had bowed legs and a slight kyphosis but otherwise the physical examination was not remarkable. There were no cataracts. The liver was not enlarged.

Laboratory tests failed to reveal any abnormalities in the protein constituents of the plasma, the electrolyte balance or the NPN. Aside from the fact that the galactose tolerance test remained grossly abnormal, there was no evidence of hepatic dysfunction or disease. A psychometric examination performed by the Gesell developmental rating placed him in the defective range.

He has continued to see his physician at regular intervals with no change in his developmental status, and on a strict galactose-free regimen he has maintained a satisfactory weight gain.

In order to complete the family picture, a short description is given of the one remaining sibling, C. F., who was found not to have galactosemia. In previous families reported where there was an unequivocal galactosemic patient, all siblings have been presumed to have the illness if there existed suggestive or similar clinical or pathologic findings. Fanconi reports a case in an otherwise normal family, but there is some question as to whether his was a true case of galactosemia. The F. family is the first recorded to have demonstrated the existence of the disorder in 2 siblings and complete freedom from the disturbance in the third.

C. F., a girl, was born after a pregnancy again characterized by hyperemesis during the entire time and consequently a deficient maternal diet. She has been entirely normal since that time while being maintained on a regimen which contains normal amounts of galactose. No galactose tolerance test has been performed but all urine samples tested have been free of any reducing substance. In contrast to that of her siblings, her development has been normal; but her weight gain has, like that of her siblings, been slow. This seems important for it would tend to place poor weight gain on the basis of a familial tendency rather than on the disease itself, as was the authors' leaning prior to C. F.'s birth. Apparently all 3 children gained weight slowly though steadily, and the older 2, once on a galactose-free diet, followed this family pattern.

Case 4: C. W., a 5 mo. old white female infant, was brought to the hospital because of hepatomegaly noted 3 days previously. The family history was negative. There had been 3 pregnancies. The first resulted in a normal child. The second child died at the age of 2 wk. of what was presumed to be a birth injury.

C. W. was born after an uneventful pregnancy at term. Her birth weight was 4700 gm. The neonatal period was entirely normal, except for occasional vomiting. She was discharged on an evaporated milk formula. There had been no jaundice or cyanosis.

At home, the patient began to vomit more frequently and at time forcibly. This did not improve with atropine nor on any of several formula changes which had in common the inclusion of galactose in one or more ingredients. In spite of this she maintained a 90 to 120 gm. weekly weight gain. The

week before admission she suffered an unexplained bout of fever which lasted 2 days and disappeared without alteration in her regimen; but at this time the hepatomegaly was detected and she was admitted.

On physical examination she showed no gross abnormality other than the hepatomegaly and, though her weight was low normal, she did not seem underdeveloped nor undernourished. The liver edge was 10 cm. below the costal margin. There was no evidence of cataracts. The remainder of the physical examination was normal.

Laboratory investigation revealed a normocytic, hypochromic anemia, melituria which disappeared on removal of galactose from the diet, albuminuria, and a ++++ cephalin flocculation test. The alkaline phosphatase was 43.2 Bodansky units, perhaps indicative of some hepatic dysfunction as all RGs of the skeleton were normal. Adrenalin and glucose tolerance tests were normal, but the galactose tolerance test was grossly abnormal. She was placed on a galactose-free diet.

When she was 23 mo. old, she was readmitted with no complaints or any abnormalities on physical examination. There were no cataracts or any hepatomegaly. Serum proteins, calcium, phosphorus, cholesterol and cephalin flocculation were normal. Her I.Q. was 85. The grossly abnormal galactose tolerance test persisted, in spite of a somewhat improved nutritional state. During the performance of the galactose tolerance test, 6.3 gm. or one third of the ingested galactose was recovered from the urine.

Case 5: T. B. was a patient originally reported in detail by Mason and Turner.[12] Since that time no further detailed investigative procedures have been performed. In 1935, because of the failure of the cataracts to clear, the lenses were needled and evacuated. Since then he has worn glasses. He has had appendicitis with successful operation. It was found that at the age of 7 yr. he could tolerate 200 cc. of milk at each meal without melituria or albuminuria, but it was still felt advisable to have the boy remain on a strictly galactose-free regimen. At this time the galactose tolerance test, using galactose 1.75 gm./kg. body weight, remained grossly abnormal, the blood sugar level reaching a peak of 503 mg./100 cc. in 3 hr., of which 290 mg. was galactose. The urinary excretion of galactose during the 6 hr. following the test was 43% of the ingested sugar. His I.Q. was 58.

Five years later he began drinking milk and eating milk-products at school and in neighborhood stores, though his mother restricted his intake at home. He suffered no ill effects and, as a matter of fact, this was not discovered until 2 yr. later when leading questions relative to his diet brought all of this to light. He was admitted to the hospital at 16 yr. of age for evaluation of his galactosemia. On physical examination he appeared to be normal but somewhat obese. His sex organs had fully matured. The eyes showed lack of the lens for the reason given. The abdomen was normal and no organs or masses were palpable.

Laboratory data failed to reveal any abnormalities other than a persistence of the markedly abnormal galactose tolerance test. During the performance of this test 33% of the 100 gm. of galactose ingested had appeared in the urine. The cephalin flocculation test was negative. The serum albumin, globulin NPN and cholesterol were all within normal limits.

By various tests his I.Q. was found to be 64 and it is of interest that the Rorschach test suggested organic brain disease.

In the intervening 3 yr. he has been well. He apparently tolerates a regular diet which contains variable but sizable quantities of galactose. He is now 18 yr. old.

When the histologic picture of cirrhosis was found in the liver biopsy in Case 1, the records of all children who had had Laennec's cirrhosis before the age of 2 yr. were reviewed, 3 cases in all being found. In one case, the evidence of hepatitis outweighed the importance of an abnormal galactose tolerance test, which therefore was considered as an indication of a damaged liver. A second case was that of a 9 mo. old infant who had had cirrhosis severe enough to distort the entire architecture of the liver. The child died at the age of 2 yr. after carcinomatous degeneration of the cirrhotic liver. In spite of a stormy course and marked evidence of hepatic dysfunction, there was no melituria and the galactose tolerance test was only mildly abnormal.

The following case is of especial interest in that the infant presented a picture compatible with galactosemia and necropsy showed cirrhosis of the liver similar to Case 1.

Case 6: T. M. was a 4 mo. old infant who was admitted to Babies Hospital because of inability to retain feedings in spite of several formula changes, malnutrition and marked abdominal distention. He appeared to be both acutely and chronically ill, showing episodes of respiratory distress. The liver was palpated 6 cm. below the costal margin.

Laboratory examinations revealed a normocytic, hypochromic anemia. There was melituria, caused by a nonfermentable sugar, albuminuria and many hyaline and granular casts. The serum albumin was 2.84 gm./100 cc. and the serum globulin 1.08 gm. The serum calcium, phosphorus and phosphatase were normal. The serum cholesterol was 99 mg./100 cc., with a combined-to-free ratio of 0.62 (normal 2.2-2.5). The galactose tolerance test was abnormal. The depression of blood glucose was unusually severe and prolonged, resulting in hypoglycemic shock which was alleviated only by repeated intravenous injections of glucose. However, in spite of this treatment, the patient was unable to maintain an adequate glucose blood level, and died 48 hr. later.

The necropsy findings were similar to those described in the liver biopsy of Case 1. There was an increase in the amount of portal connective tissue and in connective tissue strands between the portal areas which served to define the lobules of malformed liver cells. There was moderate proliferation of the bile ducts in the connective tissue without evidence of biliary stasis. These changes approximate those of Laennec's cirrhosis. There was a small amount of pneumonia in the lungs but no other organs showed significant lesions.

Discussion

Galactosemia represents a congenital metabolic defect in which the tissues are unable to metabolize galactose normally. The chief seat of this defect is most probably the liver, but not all galactose metabolism occurs in the liver.[19-21] However, the liver is the main organ of the body to suffer anatomic damage and demonstrates this by blood chemical changes which indicate disturbed function. The manner in which this damage is wrought has been the subject of much debate. One view is that it is the result of the absolute or relative hypoglucosemia which accompanies galactosemia[12]; another is that galactose as such is a toxic substance and exerts its damaging effects by its presence in high concentration in the blood stream.

The cases reported here add little to the understanding or to the clinical picture of the disease. However, one of the cases (Case 1) is unique in that the authors had evidence of hepatic damage on the initial admission, with clearance of all manifestations of galactosemia and of the accompanying hepatic dysfunction in response to appropriate therapy, followed by a recurrence of hepatic damage after inadvertent resumption of galactose feedings. Biopsy of the liver demonstrated classical Laennec's cirrhosis but of greater interest is the condition of the hepatic cells which suggested to some pathologists the appearance of liver cells after the intravenous injection of sucrose. This fact would tend to support those who postulate that galactose per se is toxic to the body tissues.

On the other hand, Case 6 demonstrates the inability of galactose to maintain the body free from hypoglycemic shock though maintaining an adequate total blood sugar level, and re-emphasizes the point that hypoglucosemia may account for some of the damaging effects of the disorder. This case, too, had cirrhosis of the liver of the Laennec's type, the third such case to be reported. Bell's description of fatty infiltration of the liver "closely resembling the fatty livers found in patients with diabetes or alcoholism or those produced experimentally by high fat diets or other means" might well be an earlier stage of the degeneration of the liver to a cirrhotic state under the toxic influence of unusually high levels of galactose.

The occurrence of Laennec's cirrhosis of the liver in infancy is a rare phenomenon. Hence galactosemia ranks high as a cause of this type of cirrhosis though it is by no means the only one.

The clinical characteristics of galactosemia are not apparent at birth but the defect is congenital, as was shown by Case 3 diagnosed on routine urinalysis during the neonatal period. The infants developed normally for varying periods of time except for feeding difficulties which gradually become more severe, with vomiting and even diarrhea super-

vening. Next is weight loss, and then hepatomegaly and nuclear cataracts. These findings have been reversible in all but one of the cases and also in those of others, but early recognition of the condition is essential for successful reversal. Case 5 demonstrates that the cataracts may become permanent and require surgical treatment.

Mental retardation was present to a significant degree in all the cases, without relation to the severity of the disease. In fact, T. F. demonstrated a greater degree of mental retardation than his sibling, J. F., though the latter had galactosemic manifestations while the former was not allowed to develop any of the signs of galactosemia. The normal sibling is showing normal mental and physical development, which suggests that the mental retardation is part of the metabolic defect or exists concurrently. This implies that a concurrent neurologic defect may be present, or that galactose in utero may be damaging. T. B., who showed the severest degree of mental retardation, ingested galactose over the longest period of time, suggesting that the longer the individual is exposed to galactose the greater the degree of damage. Galactose when given in excess to chicks produced death in convulsions, leading Dam[22] to postulate that the sugar is directly toxic to the brain. The cases reported here support this assumption.

The prolongation of the neonatal and presumably physiologic jaundice in many of the cases in the literature and among the six cases presented here is not a constant feature and is not related to the severity of the galactosemia nor to the degree of hepatic dysfunction that subsequently develops. However, it is possible that neonatal jaundice is prolonged in some individuals because the hepatotoxic effect of galactose inhibits the excretion of bilirubin.

Galactosemia is not so rare a disorder as the literature would imply, for many pediatric centers have at least one and usually more cases which have not been published. The pattern is fairly uniform and the authors' cases fall into that pattern but are presented together because they demonstrate (1) that mental retardation is a salient complication of the disorder; (2) that cirrhosis may, but does not necessarily, complicate the disorder; (3) that so far this cirrhosis seems to be reversible; (4) that with advancing age, the cessation of growth, and the consequent diminution of the amount of galactose ingested in relation to body weight, these individuals may gradually tolerate a regular diet without apparent toxic effects.

Summary

Five additional cases of galactosemia are added to the steadily increasing number of reports in the literature. A follow-up note is included regarding a sixth case in a patient now 18 years of age, previously reported from this hospital.

Two of these cases developed cirrhosis of the liver in a manner suggesting that galactosemia per se was the cause. Histologic examination of the liver in both cases confirmed the anatomic diagnosis.

A 10 year follow-up on Mason and Turner's reported Case 7 demonstrates that the illness is chronic but that with advancing years, demonstrable evidence of somatic damage is lacking. Mental retardation is a common complication of the disorder in the present investigators' experience. Cirrhosis of the liver accompanying galactosemia appears to be reversible, so far as can be determined.

References

1. Ratnoff, O. D., and Patek, A. J., Jr., Natural history of Laennec's cirrhosis of liver, Medicine 21:207, 1942.
2. Wade, L. J., Liver function tests, Am. J. Clin. Path. 16:426, 1946.

3. Colcher, H., Patek, A. J., Jr., and Kendall, F. E., Galactose disappearance from blood stream, J. Clin. Investigation **25**:768, 1946.
4. Madagan, N. F., Galactose tolerance as test of liver function, Quart. J. Med. **9**:151, 1940.
5. Barnes, C. G., and King, E. J., Galactose tolerance tests in thyrotoxicosis, Quart. J. Med. **12**:129, 1943.
6. Althausen, T. L., Lockhardt, J. C., and Soley, M. H., New diagnostic test (galactose) for thyroid disease, Am. J. M. Sc. **199**:342, 1940.
7. Wagner, R., Galactose tolerance test in endocrine disorders in children, Am. J. Dis. Child. **65**: 207, 1943.
8. von Reuss, A., Zuckerausscheidung im Säuglingsalter, Wien. med. Wchnschr. **58**:799, 1908.
9. Göppert, F., Galaktosurie nach Milchzuckergabe bei angeborenem, familiärem, chronischem Leberleiden, Berl. klin. Wchnschr. **54**:473, 1917.
10. Fanconi, G., Hochgradige Galaktose Intoleranz bei einem Kinde mit Neurofibromatosis Recklinghausen, Jahrb. f. Kinderh. **138**:1, 1933.
11. Unshelm, E., Ueber die Glycogenkrankheit, Deutsch. med. Wchnschr. **60**:633, 1934.
12. Mason, H. H., and Turner, M. E., Chronic galactemia, Am. J. Dis. Child. **50**:359, 1935.
13. Norman, F. A., and Fashena, G. J., Chronic hypergalactosemia, Am. J. Dis. Child. **66**:531, 1943.
14. Mellinkoff, S., Roth, B., and MacLaggan, J., Galactosemia with hepatic damage, J. Pediat. **27**:339, 1945.
15. Bruck, E., and Rapoport, S., Galactosemia in infant with cataracts, Am. J. Dis. Child. **70**:267, 1945.
16. Goldbloom, A., and Brickman, H. F., Galactemia, J. Pediat. **28**:676, 1946.
17. Goldstein, E. O., and Ennis, J. M., Galactosemia, J. Pediat. **33**:147, 1948.
18. Greenman, L., and Rathbun, J. C., Galactose studies in infant with idiopathic galactose intolerance, PEDIATRICS **2**:666, 1948.
19. Bell, L. S., Blair, W. C., Lindsay, S., and Watson, S. J., Galactose diabetes, J. Pediat. **36**:427, 1950.
20. Kosterlitz, H. W., and Ritchie, C. M., Assimilation of glucose and galactose in liver, Biochem. J. **37**:618, 1943.
21. Harding, V. J., and Grant, G. A., Metabolism of galactose, J. Biol. Chem. **99**:629, 1932.
22. Dam, H., Galactose poisoning in chicks, Proc. Soc. Exper. Biol. & Med. **55**:57, 1944.

SPANISH ABSTRACT

Galactosemia y su Relación con la Cirrosis de Laennec; Revisión de la Literatura y Reporte de Seís Casos Adicionales

Galactosemia es una deficiencia metabolica especifica capaz de producir efectos profundos sobre el desarrollo, crecimiento y estado general de la salud. Las caracteristicas esenciales de esta enfermedad son la presencia de dificultades en la alimentacion desde el periodo neo-natal, desnutricion, hepatomegalia, galactosuria, deficiencia mental y a veces cataratas nucleares. Los autores hacen un sumario de nueve casos publicados de galactosemia y reportan seis casos adicionales haciendo un total de 15 casos reportados. Indudablemente este numero solo representa una pequeña minoria del total de casos existentes de esta afección.

Se reporta en detalles el caso de un niño de seís meses de edad con el cuadro clinico descrito y presentando además evidencias fisicas y fisiologicas de insuficiencia hepatica. Estos sintomas desaparecieron gradualmente con un regimen libre de galactosa. En una ocasión el incumplimiento inadvertido del regimen dietario causó la reaparición de todos los sintomas y una biopsia del higado durante esa ocasión, reveló la presencia de una cirrosis de Laennec.

Una revisión de todas las historias necropsicas de niños con cirrosis de Laennec reveló otro caso adicional en el cual la galactosemia constituyó un factor etiologico de la cirrosis.

La disfunción hepatica observada en la galactosemia es producida por los niveles altos de galactosa en la sangre y por el desarrollo de una hipoglicemia inducida por los valores altos de azucares totales de la sangre. Con un regimen dietario apropiado estos niños con galactosemia pueden desarrollarse normalmente hasta la edad adulta, fecha en que la ingestión de leche o productos de la leche no parecen producir efectos nocivos fisicos ó fisiologicos al individuo. Los autores señalan la frecuencia de retraso mental como componente de este sindrome.

630 West 168th Street

VOLUMETRIC AND MICROSCOPIC PATTERN OF BONE MARROW IN NORMAL INFANTS AND CHILDREN

III. Histologic Pattern

By PHILLIP STURGEON, M.D.
Los Angeles

PREVIOUS reports[1, 2] presented the volumetric and cytologic patterns of bone marrow aspirated from the tibia, iliac crest and sternum of normal infants and children. The volumetric data obtained from the sternal and iliac aspirations gave similar values. It was noted that, in the age range studied, these values were comparable to those volumetric data reported for older normal individuals. In contrast, the volumetric data from the tibial aspirations showed a tendency toward increased fat and decreased myeloid-erythroid values at a relatively young age (2½ years).

The percentage distribution of nucleated cells from the tibial aspirations also changed considerably with increasing age. Predominantly, the early nucleated forms of all cell lines tended to disappear; the late normoblasts were markedly reduced, and small lymphocytes and segmented granulocytes comprised the majority of cells. In contrast, the percentage distribution of nucleated cells from the sternal and iliac aspirations in the age ranges studied showed no apparent differences between the two sites nor influence of age on the date.

The purpose of this part of the study was (1) to characterize the histologic pattern of particles isolated from the 72 aspirations from which volumetric and cytologic data were reported in the previous communications, (2) to determine the relation between the amount of fat tissue and hemopoietic tissue in the histologic sections and the influence of age on this relation and (3) to study the occurrence of lymph follicles in the marrow of normal infants and children.

MATERIALS AND EQUIPMENT

The normal subjects employed in this study have been characterized clinically in a previous report.[1] The data from a tibial aspiration in a normal 6 yr. old subject have been added to this study (Case a) because particles were obtained from only 1 tibial aspiration on individuals over 2½ yr. old.

The technic employed in aspirating the marrow and its processing for volumetric and cytologic studies have been described in the preceding reports.[1, 2] The heparinized marrow remaining after a 1 cc. portion had been withdrawn for volumetric and cytologic examinations was used in this part of the study. The method described by Schleicher[3] was used in isolating the particles ("bone marrow units"), and the number and size were noted. Particles about 0.5 mm. in diameter were considered moderate in size, those less than 0.5 mm. as small, and particles of 1.0 mm. or greater in diameter as large. The particles were then prepared for histologic sectioning and stained with hematoxylin and eosin as described by Tucker;[4] serial sections of the entire blocks were made. The equipment used in isolating the particles is illustrated in Fig. 1; its use in the procedure is explained in the accompanying legend. Recent modifications of these technics which at present are proving time saving have been described by Anderson and Armstrong[5] and Berman and Axelrod.[6]

The relation of hemopoietic tissue to fat tissue was determined, with the aid of a Wipple ocular

From the Department of Pathology, Children's Hospital, and the University of Southern California School of Medicine, Los Angeles.

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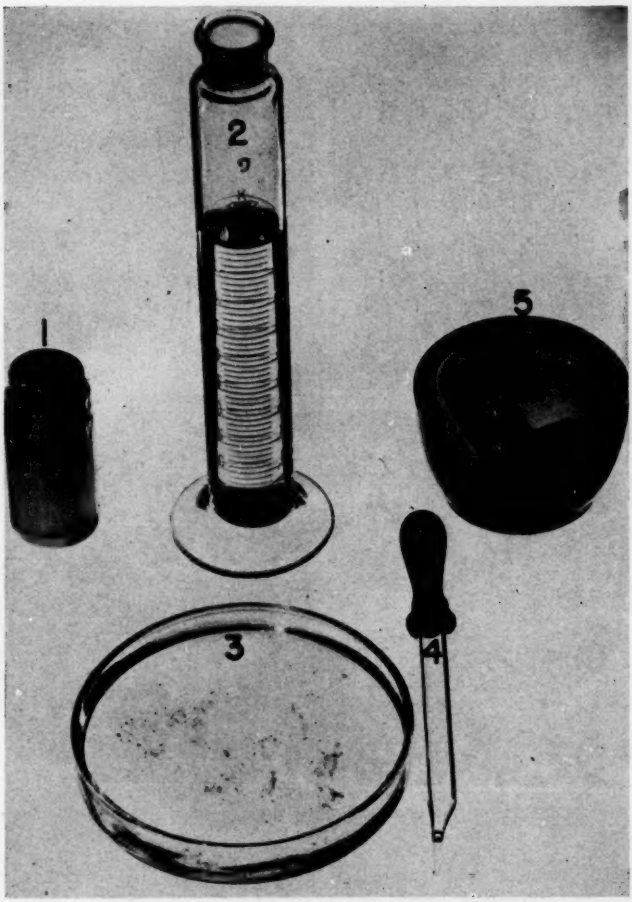

FIG. 1. 1. Paraffin-lined vial containing aspirated marrow fluid remaining after 1 cc. withdrawn for volumetric determinations. 2. 10% neutral formaldehyde in saline, for fixation of marrow fluid. 3. Petri dish(es) for visualization of particles and separation from blood. 4. Pipette used in separation of particles. 5. Dish used in dehydrating particles. After dehydration, particles are embedded in paraffin, sectioned and stained.

micrometer, by estimating the percentage of the included microscopic field composed of hemopoietic tissues. Rough reference standards were established by taking photomicrographs of particles of increasing amounts of hemopoietic tissues. Figs. 2, 3 and 4 illustrate the reference standards, the estimated cellularity and the site and age of the normal individual from whom they were obtained.

Imprints were made from some of the particles as described by Schleicher;[7] microscopic examination of these were not included in this study.

RESULTS

Bone marrow particles ("units") sufficient in number and adequate in size for processing and histologic sectioning were obtained in 23 of the 72 aspirations. Particles were obtained from approximately one third of the aspirations from each site. Failure

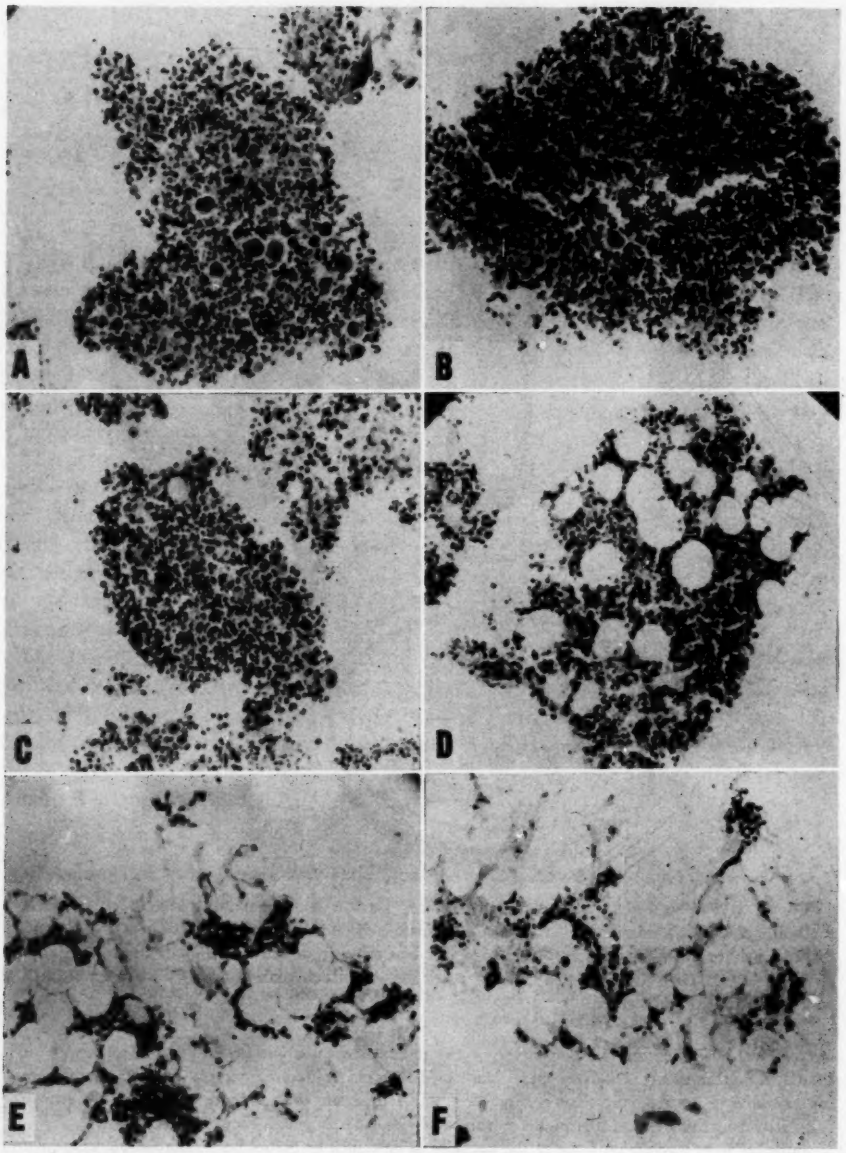

FIG. 2. Microscopic appearance of particles from tibia of normal infants and children. Magnification approximately 348. A. Case 12, 3 days old. B. Case 17, 6 days old. C. Case 18, 2 wk. old. D. Case 29, 19 mo. old. E. Case 38, 4½ yr. old. F. Case a, 6½ yr. old.

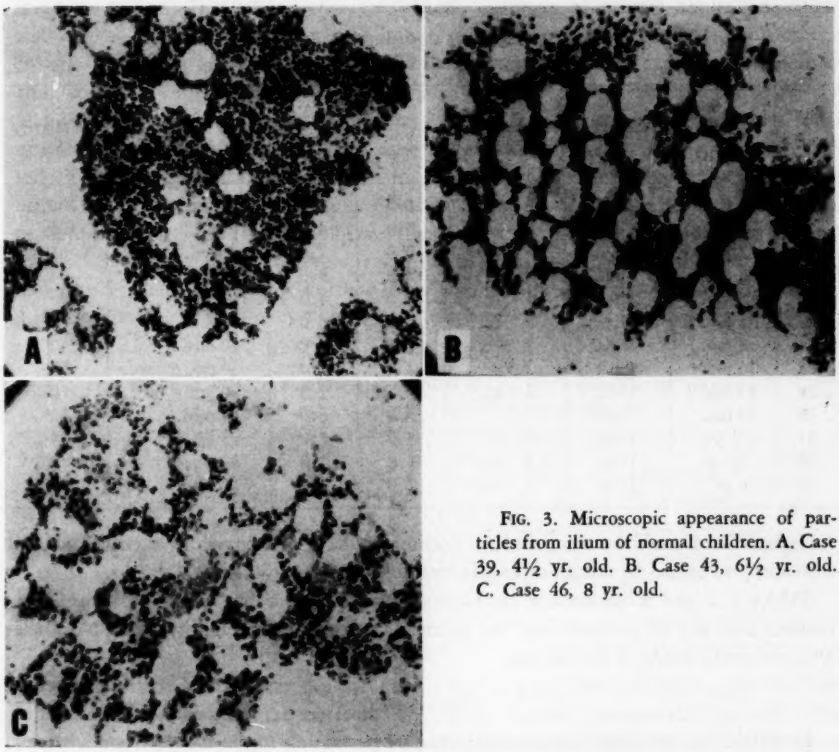

FIG. 3. Microscopic appearance of particles from ilium of normal children. A. Case 39, 4½ yr. old. B. Case 43, 6½ yr. old. C. Case 46, 8 yr. old.

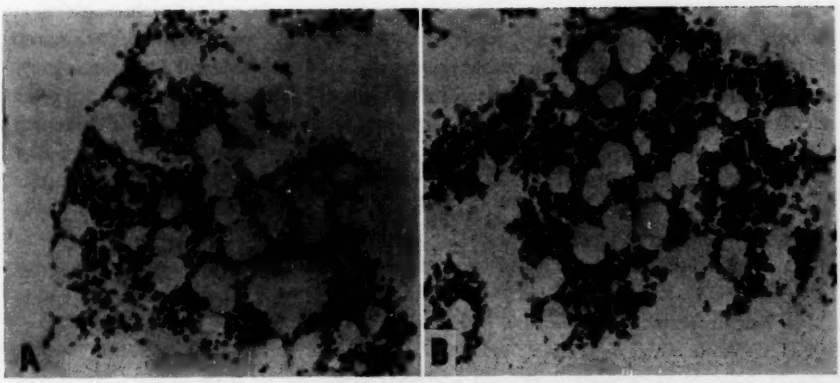

FIG. 4. Microscopic appearance of particles from sternum of normal children. A. Case 41, 5 yr. old. B. Case 48, 11 yr. old.

TABLE 1

CLINICAL AND VOLUMETRIC DATA COMPARED TO ESTIMATED CELLULARITY OF PARTICLES FROM 13 TIBIAL ASPIRATIONS

Subject No.	Age	Site of Aspiration	Amount of Aspiration	Fat Vol. %	M.E. Vol. %	Particles No. and Size	Cellularity %
12	3 days	Tibia	2 cc.	0.0	3.0	20 med.	100%
17	6 days	Tibia	3 cc.	0.0	4.0	10 sm.	100%
18	2 wk.	Tibia		0.0	7.0	15 med.	85%
19	2 mo.	Tibia		0.0	9.0	10 sm.	95%
20	3 mo.	Tibia	4 cc.	0.0	4.0	15–20	95%
23	5 mo.	Tibia	3 cc.	2.0	6.0	100 med.	60%
24	8 mo.	Tibia	2.5 cc.	2.5	4.0	40 med.	40%
28	16 mo.	Tibia	2.5 cc.	4.0	3.0	30 sm. & med.	50%
29	19 mo.	Tibia	3 cc.	1.5	1.5	20 lg.	60%
30	19 mo.	Tibia		5.0	5.0	15 med.	50%
33	2½ yr.	Tibia	4 cc.	4.0	7.0	75 lg.	35%
38	4½ yr.	Tibia	3 cc.	3.0	1.0	50 sm.	20%
a	6 yr.	Tibia	3 cc.	2.0	1.0	10 med.	10%

to isolate them could be attributed to clotting of the specimen which occurred in four instances and to the aspiration of insufficient fluid in three instances.

Tables 1, 2 and 3 list some of the clinical and volumetric data, the approximate gross number and size of particles and the estimated microscopic cellularity. Lymph follicles were not noted in any of the sections.

DISCUSSION

In relation to the rather voluminous literature pertaining to the study of bone marrow, relatively few reports deal with the data obtained from histologic examination of aspirated bone marrow particles. Veeneklass,[8] using a technic in which particles are isolated with the use of a blotter, reported on his findings from a study of 101 normal infants and children. Sternal aspirations were performed exclusively; 15 histologic preparations were made, but were studied only cytologically. The histologic cellularity of the preparations in relation to age is not discussed, nor did the study include volumetric

TABLE 2

CLINICAL AND VOLUMETRIC DATA COMPARED TO ESTIMATED CELLULARITY OF PARTICLES FROM 7 ILIAC ASPIRATIONS

Subject No.	Age	Site of Aspiration	Amount of Aspiration	Fat Vol. %	M.E. Vol. %	Particles No. and Size	Cellularity %
30	19 mo.	Ilium		1.0	7.0	15 med.	70%
35	3 yr.	Ilium	2 cc.	1.0	3.5	10–20?	40%
39	4½ yr.	Ilium	2 cc.	1.0	5.0	25 sm.	80%
38	4½ yr.	Ilium	3 cc.	1.0	3.0	25 sm.	40%
43	6½ yr.	Ilium		2.0	5.0	10–15 lg.	40%
46	8 yr.	Ilium	5 cc.	1.0	3.0	50 sm.	40%
48	11 yr.	Ilium	5 cc.	2.0	4.0	30 sm.-lg.	50%

measurements. Schleicher[9] has characterized the histology of normal adults' bone marrow studied by the technic employed in this report. He estimated the fat content of a particle ("marrow unit") by counting the number of fat cells in a given area. Berman and Axelrod, [10, 11] on the other hand, estimated microscopically the percentage of fat and of hemopoietic tissue in particles obtained by essentially the same technic from a series of pathologic cases. Inasmuch as fat tissue can increase in volume by hypertrophy, thus reducing the hemopoietic cellularity of the marrow without any increase in the number of fat cells, a fat-cell-counting technic was not used in this study; instead, the method of Berman and Axelrod was employed. The accuracy of their technic proved to be satisfactory. They report two observers' estimates to agree within 10%, and that estimates based on a study of 10 fields did not differ significantly from those based on two hundred fields.

TABLE 3

CLINICAL AND VOLUMETRIC DATA COMPARED TO ESTIMATED CELLULARITY OF PARTICLES FROM 4 STERNAL ASPIRATIONS

Subject No.	Age	Site of Aspiration	Amount of Aspiration	Fat Vol. %	M.E. Vol. %	Particles No. and Size	Cellularity %
41	5 yr.	Sternum	3 cc.	1.0	3.0	20 sm.-lg.	40%
42	6 yr.	Sternum	3 cc.	0.5	4.0	25 med.	50%
46	8 yr.	Sternum	2.5 cc.	1.0	3.0	25 sm.	35%
48	11 yr.	Sternum	3 cc.	3.0	7.0	30 sm.-lg.	50%

In view of the small number of aspirations in this study that resulted in particles from individuals in any age group or from any site, it appears unreasonable to form other than the most general impressions regarding the normal histologic pattern of bone marrow in infants and children.

Insofar as age is concerned, particles histologically free of fat (100% cellularity) were found only in three individuals 2 months of age or younger. As early as 2 weeks of age, however, some particles showed the presence of fat tissue (see Fig. 2C). The iliac and sternal aspirations which were obtained from individuals 18 months of age through 11 years varied in cellularity from 50 to 70% without any tendency for the cellularity to decrease with age (see Figs. 3 and 4). On the other hand, one tibial aspiration as early as 8 months of age showed 40% cellularity, and one aspiration at 4½ years of age showed 20% cellularity (see Fig. 2E). This latter observation requires confirmation but is of interest because it comes from a normal individual. Berman and Axelrod's observations using similar technic on pathologic material from sternal aspirations showed a minimum cellularity of approximately 52%

From the results presented it is apparent that the volumetric data furnishes only a crude estimate of the actual relation between fat tissue and hemopoietic tissue. A volumetric reading with no fat likely reflects a marrow histologically of 80% or more cellularity. On the other hand, the tibial aspirations having a relatively high volumetric fat (2 mm. or over) and a low myeloid-erythroid layer (1 mm. or less) produced the only particles which were in the 80% fat (20% cellularity) range (Cases 38 and a). Between these two extremes the specimens may vary histologically from an estimated 35 to 80% fat and yet have quite similar volumetric data. Berman and Axelrod's ob-

servations on adult pathologic material revealed ranges of histologic cellularity almost as great as those just mentioned. Therefore it appears necessary to ascribe wide histologic limits to most isolated volumetric observations. Nevertheless, if blood dyscrasias in infants and children produce profound alteration in bone marrow anatomy beyond these limits, it may then be possible for the volumetric data to prove useful in the evaluation of pathologic material when particles for histologic studies are not obtained.

The literature on the occurrence of lymph follicles in the bone marrow of adults was reviewed by Williams.[12] Data from 265 unselected cases of his own were added. He found an incidence of 10% for individuals under 40 years of age and an incidence of 32% over that age. More recently Schleicher,[9] in the study of 14 carefully selected normal males between 14 and 40 years of age, found no lymph follicles. He states that they are not a constituent of the normal human marrow. Veeneklass[13] studied sternal marrow from 101 normal infants and children. He mentions that in the 15 instances that histologic sections were made, no lymph follicles were noted. In the 23 normal cases reported in this study, no lymph follicles were found.

Summary and Conclusions

In normal infants 3 months of age or younger, particles obtained from the bone marrow by the described aspiration technic may be comprised of 80% or more hemopoietic tissue.

Particles obtained by aspirations of the sternum and iliac crest from normal individuals 19 months through 11 years of age may vary from 35 to 80% hemopoietic tissue.

Aspirations from the tibia of normal individuals 4½ years of age or older may contain 20% or less hemopoietic tissue.

No lymph follicles were found in serial sections of particles from 23 normal individuals 3 days through 11 years of age.

References

1. Sturgeon, P., Volumetric and microscopic pattern of bone marrow in normal infants and children. I. Volumetric pattern, Pediatrics **7**:577, 1950.
2. Sturgeon, P., Volumetric and microscopic pattern of bone marrow in normal infants and children. II. Cytologic pattern, Pediatrics **7**:642, 1950.
3. Schleicher, E. M., Isolation of particles from aspirated sternal marrow, Am. J. Clin. Path. **17**:909, 1947.
4. Tucker, B., Method of histological preparations from aspirated "sternal marrow units," Am. J. M. Technol. **13**:175, 1947.
5. Anderson, W., and Armstrong, A. R., Marrow biopsy and its processing for histologic preparations, Canad. M. A. J. **57**:543, 1947.
6. Berman, L., and Axelrod, A. R., Aspiration of sternal bone marrow, technics for obtaining volumetric readings, smears, imprints and histopathological sections, Am. J. Clin. Path. **17**:61, 1947.
7. Schleicher, E. M., Method for making imprints and direct smears from gross marrow units, Am. J. Clin. Path. (tech. sect.) **9**:8, 1945.
8. Veeneklass, G. M. H., Sternum punctie Bij Kinderen, Maandschr. v. kindergeneesk. **8**:45, 1938.
9. Schleicher, E. M., Volumetric pattern of aspirated normal human sternal marrow of males 18 to 40 years, Am. J. Clin. Path. **14**:370, 1944.
10. Berman, L., and Axelrod, A. R., Evaluation of volumetric data obtained by centrifugation of aspirated sternal marrow of adults. I. Estimation of relative fat content, Am. J. Clin. Path. **17**:551, 1947.

11. Berman, L., and Axelrod, A. R., Evaluation of volumetric data obtained by centrifugation of aspirated sternal marrow of adults. II. Estimation of cellularity of sternal marrow, Am. J. Clin. Path. 17:557, 1947.
12. Williams, R. J., Lymphoid nodules of human bone marrow, Am. J. Path. 15:377, 1939.
13. Veeneklass, G. M. H., Sternum punctie Bij Kinderen, Maandschr v. kindergeneesk. 8:118, 1938.

SPANISH ABSTRACT

Características Volumetricas y Microscópicas de la Médula Osea en Infantes y Niños Normales III. Características Histologicas

En niños normales de tres meses de edad o menores, las particulas de la médula ósea obtenidas mediante la técnica de punción descrita, contenian mas de un 80% de tejido hematopoyetico.

En las punciones obtenidas en el esternon y de la cresta iliaca de individuos normales entre 19 meses y 11 años de edad, la cantidad de tejido hematopoyetico de las particulas de la médula osea varió entre un 35 a 80%.

En las punciones obtenidas de la tibia en individuos normales de cuatro y medio años de edad o mayores, las particulas de la médula ósea pueden contener menos de un 20% de tejido hematopoyetico.

No se encontraron foliculos linfaticos en las secciones seriadas de las particulas de la médula ósea de 23 individuos normales cuyas edades variaron entre tres días y once anos de edad/

4614 Sunset Boulevard

ROLE OF HYALINE MEMBRANES, BLOOD, EXUDATE, EDEMA FLUID AND AMNIOTIC SAC CONTENTS IN PREVENTING EXPANSION OF THE LUNGS OF NEWBORN INFANTS

By FRANKLIN C. BEHRLE, M.D. DAVID M. GIBSON, M.D., AND HERBERT C. MILLER, M.D.
Kansas City, Kan.

THIS investigation was undertaken to determine what effect the presence of hyaline membranes has on the expansibility of the lungs of newborn infants.

The clinical course of infants dying with extensive hyaline membranes in their lungs is characterized by cyanosis accompanied by marked inspiratory efforts. At necropsy there is considerable atelectasis associated with the hyaline membranes which line many of the alveoli and alveolar ducts. It would seem probable that the hyaline membranes mechanically prevent the lungs from expanding, thus causing the infants to make exaggerated inspiratory efforts and resulting in a persistence of the atelectasis. While the theory is obvious enough, it has not to our knowledge been proved. It seemed important to do so, since a choice of therapeutic procedures would in part depend on whether such lungs could be expanded or not. If lungs containing hyaline membranes could not be expanded, effective treatment almost certainly would have to be directed towards preventing the formation of the hyaline membranes. The application of increased concentrations of oxygen and increased pressures could not be expected to offer a solution to the difficulties encountered once the membranes had formed.

The general plan of this investigation was to expand lungs obtained at autopsy with measured amounts of negative pressure and to correlate the microscopic appearance of the lungs before and after expansion with the amount of pressure required to obtain full expansion. Since lungs of newborn infants containing hyaline membranes frequently have present in them large amounts of edema fluid, hemorrhage, exudate and amniotic sac contents, it was clear that the effect of these substances on the expansibility of the lungs would also have to be taken into account. In order to obtain information on these points the lungs of stillborn infants as well as liveborn infants were accepted for study without regard to cause of death or state of maturity of the fetus or infant.

MATERIAL AND METHODS

The lungs of newborn infants, both stillborn and liveborn, were obtained at autopsy from various hospitals in the greater Kansas City area. No attempt was made to select the material in any way. Access was had to the hospital records of the mothers and infants as well as to the autopsy protocols on the infants. Every effort was made to have the lungs removed carefully from the thorax with the bronchi and tracheas intact. The left main bronchus was tied off securely and suitable sections were removed from the left lung for histologic preparations following fixation in 10% formalin. The right lung was then expanded with a constantly applied negative pressure and measurements made of the

From the Departments of Pediatrics and Pathology, University of Kansas School of Medicine, Kansas City, Kans.

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negative pressure at which expansion began and again when it was thought to be complete. The right lung was fixed in 10% formalin in the expanded state. After fixation sections were taken for microscopic study.

The apparatus for expanding the lung consisted of a glass jar fitted with an air-tight metal top. Two metal cannulae were soldered to the metal top permitting air to enter and leave the jar. To one of these cannulae the trachea was securely fastened permitting the lung to be freely suspended in the jar; the other end of this cannula remained open to atmospheric air or was connected to a volumetric flask which permitted a measurement to be made of the volume of air entering the lung. The other cannula extending into the jar was attached to an air pump, a water manometer being placed in the circuit between the jar and the pump. Later in the course of these experiments the air pump was replaced by a system of water flasks which permitted the negative pressure in the glass jar to be varied by raising and lowering the fluid levels in the flasks. All connections were made with noncollapsible, heavy rubber tubing. Dead space was reduced to a minimum wherever possible. It was easy to determine the presence of leaks in the system, as negative pressures were unattainable with any appreciable leak. Small leaks in the lungs were readily detected by watching for bubbles on the surface of the lung during expansion or noting the gradual return of the negative pressure to zero once the lung was expanded and after cutting off access of the expanded lung to atmospheric pressure.

In addition to measuring the amount of negative pressure required to expand the lungs, efforts were made to determine the expansibility of the lungs from a study of the histologic sections. Measurements of the size of the alveoli proved unsatisfactory because there was wide variability in the size of the alveoli in lungs containing hyaline membranes; areas of emphysema frequently alternated with areas of atelectasis in the expanded lungs. On the other hand, the thickness of the alveolar walls was readily measured by means of a filar micrometer. Representative microscopic sections were selected and the walls of 10 consecutive alveoli were measured, the final result being the average of the 10 walls. Two of the present investigators took the thinnest portion of each alveolar wall as the place of measurement; the other investigator took the point of apparent average thickness of each wall. The results of the latter were consistently higher than the results obtained by the other 2, but the trend of the results was the same regardless of whether the measurements were made at the thinnest portion of the wall or at its point of apparent average width. In the results presented in this report the data obtained by the 2 investigators measuring the walls at their narrowest visible point are given. The final results were obtained by averaging the data of these 2 investigators and hence represent the average thickness of 20 alveolar walls, exclusive of any hyaline material lining them.

Results

Autopsy material was available on 55 infants, but 12 of this number were excluded from the study because either the lungs had been so badly lacerated in their removal as to preclude expansion or data were lacking concerning the weight and viability of the infant at the time of birth. The 43 remaining cases were divided into four groups as follows: Group 1, liveborn infants without hyaline membranes who weighed more than 1200 gm. at birth; Group 2, stillborn infants with birth weights over 1200 gm; Group 3, liveborn infants without hyaline membranes who weighed less than 1200 gm. at birth; Group 4, liveborn infants with hyaline membranes irrespective of birth weight.

The amount of negative pressure required to initiate expansion of the lungs and the negative pressure at which expansion was considered to be complete are shown in table 1 for the four groups of infants. It was not difficult to determine when expansion began, as the gradual enlargement of the lung and the change in color of the lung from dark to light was readily ascertained. Greater difficulty was encountered in determining when expansion was complete. In most instances no single, definite endpoint was used. Expansion was considered to be complete if the surface of the lung became pink and homogeneous. In lungs that did not expand readily with moderate pressures, namely, less than 30 cm. of water, greater pressures were tried and continued until no further expansion could be obtained; the point at which no further expansion occurred was taken as the endpoint

TABLE 1

DISTRIBUTION OF INFANTS ACCORDING TO AMOUNT OF NEGATIVE PRESSURE APPLIED IN EXPANDING THEIR LUNGS

Group of Infants	No. of Infants	Amount of Negative Pressure Applied					
		Initial Pressure cm. of water			Final Pressure cm. of water		
		10–30	31–50	51–	10–30	31–50	51–
1. Liveborn > 1200 gm.	15	15	0	0	8	5	2
2. Stillborn > 1200 gm.	7	7	0	0	3	4	0
3. Liveborn < 1200 gm.	8	5	2	1	4	3	1
4. Liveborn, with hyaline membranes	13	12	1	0	6	6	1
Total	43	39	3	1	21	18	4

in these cases. In lungs which expanded readily with low pressures, less than 30 cm. of water, it was not difficult to conclude from the color of the lung that adequate expansion had occurred. In 7 of the 43 lungs actual measurements of the volume of the lung before and after expansion were made; it was found that doubling the initial volume of the lung resulted in an expansion which appeared comparable to the degree and expansion of those lungs in which volumetric determinations had not been made. As shown in table 1, the pressures at which expansion began were less than 30 cm. of water in 39 of the 43 cases. The four exceptions occurred in the two groups in which it subsequently will be shown expansion was poorest and most difficult to obtain, namely, those with hyaline membranes and those liveborn infants with birth weights less than 1200 gm. The final pressure at which expansion was thought to be complete was less than 30 cm. of water in 21 of the 43 cases; negative pressures from 31 to 50 cm. of water were required in 18 and in 4 negative pressures over 51 cm. of water were needed. The final pressures required to complete expansion of the lungs did not seem to vary significantly from group to group in table 1. The pressure readings taken by themselves would indicate that there were no differences in the expansibility of the lungs in the four groups. Microscopic examination of the lungs, however, revealed that the pressure readings could not be relied upon as a true indication of lung expansion. The importance of the pressure readings resided in the fact that such differences in expansion as were found in the histologic sections could not be related to the pressures that were applied.

TABLE 2

AVERAGE THICKNESS OF ALVEOLAR WALLS BEFORE AND AFTER EXPANSION

Group of Infants	No. of Infants	Average thickness of walls:	
		Before Expansion, μ	After Expansion, μ
1. Liveborn > 1200 gm.	15	29.2	11.7
2. Stillborn > 1200 gm.	7	17.7	11.0
3. Liveborn < 1200 gm.	8	31.3	31.3
4. Liveborn, with hyaline membranes	13	34.2	32.2

The results of the measurements of the thickness of the alveolar walls of lungs before and after expansion are shown in table 2. The average figures for each of the four groups are given. For the liveborn infants, Groups 1, 3 and 4, the thickness of the alveolar walls averaged approximately 30μ before expansion. Among the stillborn infants, Group 2, the walls had an average width of 17.7μ before expansion, or a little less than half the diameter of the alveolar walls of liveborn infants. The difference seemed to be accounted for largely by a greater amount of blood in the alveolar capillaries of the liveborn infants. The effect of applying pressures which brought about apparent full expansion of the lung was negligible in altering the width of the alveolar walls of liveborn infants with birth weights under 1200 gm., Group 3, and of infants with hyaline membranes, Group 4. In both groups the average width of the alveolar walls remained above 30μ. On the other hand, there was a considerable reduction in the width of the alveolar walls of the lungs of liveborn infants with birth weights over 1200 gm. and without hyaline membranes, Group 1, the walls having been reduced in width from 29.2 before expansion to 11.7μ after expansion. The latter figure compares favorably with the figure of 11μ obtained after expanding the lungs of stillborn infants, Group 2.

TABLE 3

DISTRIBUTION OF INFANTS ACCORDING TO THICKNESS OF ALVEOLAR WALLS OF THEIR LUNGS AFTER EXPANSION

Group of Infants	No. of Infants	Thickness of Alveolar Walls After Expansion			
		μ			
		6–15	16–25	26–35	36 +
1. Liveborn > 1200 gm.	15	13	2	0	0
2. Stillborn > 1200 gm.	7	6	1	0	0
3. Liveborn < 1200 gm.	8	1	0	5	2
4. Liveborn, with hyaline membranes	13	1	3	6	3

The variations in the thickness of the alveolar walls of individual infants were so great that the average results obtained in this small series are not too significant without showing the range over which the results were distributed. This has been done in table 3. It can be seen from inspection of table 3 that the differences brought out in table 2 are dependent on the fact that in Groups 3 and 4, in which practically no change in the average width of the alveolar walls could be demonstrated following expansion, 19 out of the 21 infants had lungs with alveolar walls over 15μ in width, while in Groups 1 and 2, only 3 out of 22 had lungs whose alveolar walls were over 15μ in diameter. The one infant in Group 4 whose alveolar walls following expansion averaged less than 16μ had minimal amounts of hyaline membranes in the lungs. The infant in Group 3 whose alveolar walls average less than 16μ in thickness after expansion weighed 510 gm., which was the lowest birth weight in the group.

The effect of the presence of foreign materials other than hyaline membranes in the air spaces on the expansibility of the lungs was determined by estimating the amounts of blood, edema fluid, exudate and cornified epithelial cells in the air spaces in each of the 43 lungs by microscopic examination of the lungs. All three investigators graded

the lungs from 0 to 4 for each of the four constituents mentioned. The final grade was determined by mutual agreement. The results obtained in the four groups of infants are compared in table 4. It can be seen that in general there was not much difference in the amounts of these materials from group to group. The lungs of infants in Group 4 all contained some edema fluid and probably more than was to be found in the other three groups. The amount of hemorrhage was about the same in Groups 1 and 4 and in both of these groups it was greater than in Groups 2 and 3. Likewise, the amount of polymorphonuclear leukocytic exudate was probably greater in Groups 1 and 4 than in Groups 2 and 3. On the other hand, the numbers of cornified epithelial cells was greater among the infants in Group 2 than in the other three groups, being about the same in Groups 1 and 4. The importance of these findings is that the differences in expansion obtained after applying negative pressures cannot be explained by the presence or absence of these foreign materials. The lungs of the premature infants in Group 3 expanded

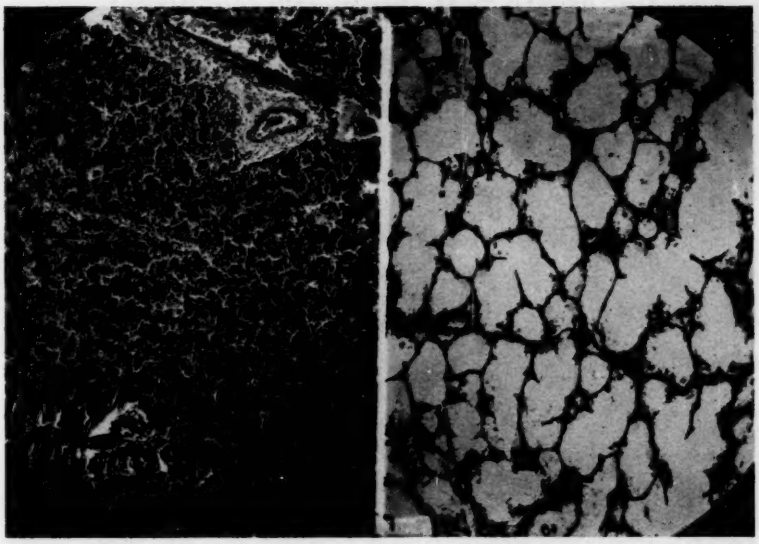
TABLE 4

DISTRIBUTION OF INFANTS ACCORDING TO AMOUNT OF FOREIGN MATERIALS OTHER THAN HYALINE MEMBRANES IN ALVEOLI OF THEIR LUNGS

Group of Infants	No. of Infants	Edema Fluid					Hemorrhage					Polymorph. Leukocytes					Cornified Epith. Cells				
		0	1	2	3	4	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
1. Liveborn>1200 gm.	15	2	7	3	0	3	4	5	2	1	3	7	4	2	1	1	11	2	0	1	1
2. Stillborn>1200 gm.	7	1	2	2	0	2	5	1	1	0	0	4	2	0	0	1	2	1	0	1	3
3. Liveborn<1200 gm.	8	3	4	0	1	0	8	0	0	0	0	4	2	0	1	1	8	0	0	0	0
4. Liveborn, with hyaline membranes	13	0	5	2	0	6	3	2	2	1	5	3	4	2	3	1	7	4	0	0	2

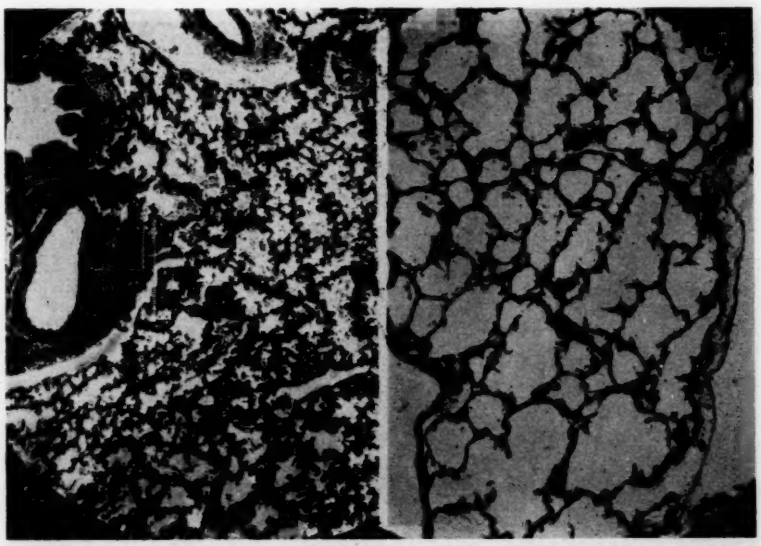
very little as a result of the pressures applied and yet the lungs of these infants contained less foreign materials in them than did the lungs in the other three groups. The lungs of liveborn infants with birth weights over 1200 gm., Group 1, contained blood, edema fluid, exudate and cornified epithelial cells to about the same extent as did those of the infants with hyaline membranes, Group 4, and yet there was far better expansion obtained in Group 1 than in Group 4. The poor expansion obtained in Group 4 as compared to Group 1 can not be explained by the factor of birth weight, for only one of the infants in Group 4 weighed less than 1200 gm. and 6 of the 13 weighed more than 2500 gm. as compared to 9 of the 15 in Group 1 who weighed over 2500 gm.

The failure of the presence of the various foreign elements other than hyaline material to prevent good expansion of the lung even when they occurred in large amounts is illustrated in Figs. 1, 2, 3 and 4. These photomicrographs were selected because the unexpanded lungs of these infants contained extensive hemorrhage (Fig. 1), large numbers of cornified epithelial cells (Fig. 2), extensive polymorphonuclear leukocytic exudate (Fig. 3), and large amounts of edema fluid plus hemorrhage (Fig. 4). The right hand half of each photomicrograph shows the lungs after expansion. These degrees of expansion were obtained with final negative pressures of 20, 18, 32 and 29 cm. of water, respectively. It is true that the opposite lung was used to illustrate the effects of expansion and it cannot be stated that the microscopic findings were identical in both sides. However, even a superficial view of the expanded portions of the lungs in the photomicrographs



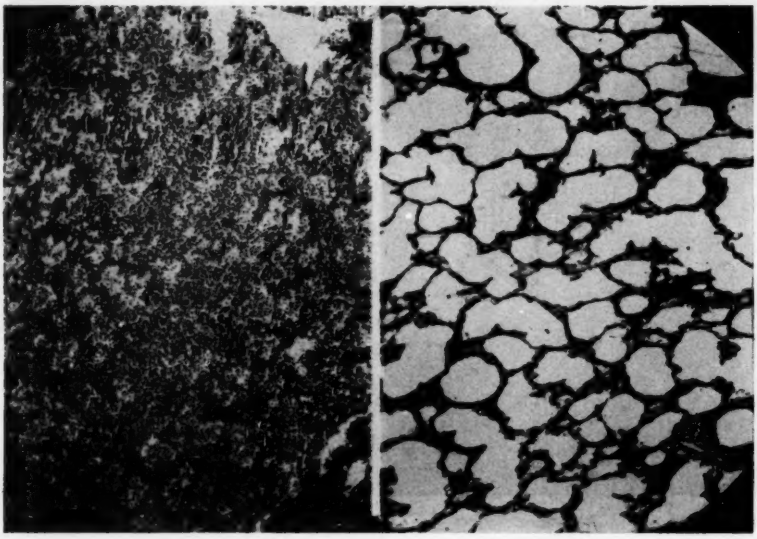
BEFORE AFTER

FIG. 1. Lung of infant with birth weight of 4150 gm. dying at 50 hr. Before expansion alveolar walls averaged 27μ in width and after expansion 6μ. Lung contained hemorrhage, 4+; edema fluid, 0; exudate, 0; cornified epithelial cells, 0; hyaline membranes, 0. Final pressure, 20 cm. of water.



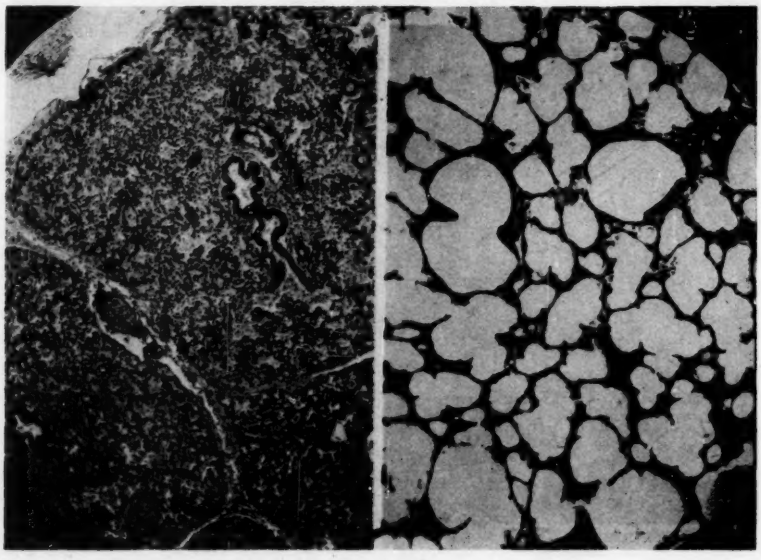
BEFORE AFTER

FIG. 2. Lung of stillborn infant with birth weight 2385 gm. Before expansion alveolar walls averaged 33μ in width and after expansion, 14μ. Lungs contained cornified epithelial cells, 4+; edema fluid, 1+; exudate, 0; hemorrhage, 0; hyaline membrane, 0. Final pressure, 18 cm. of water.



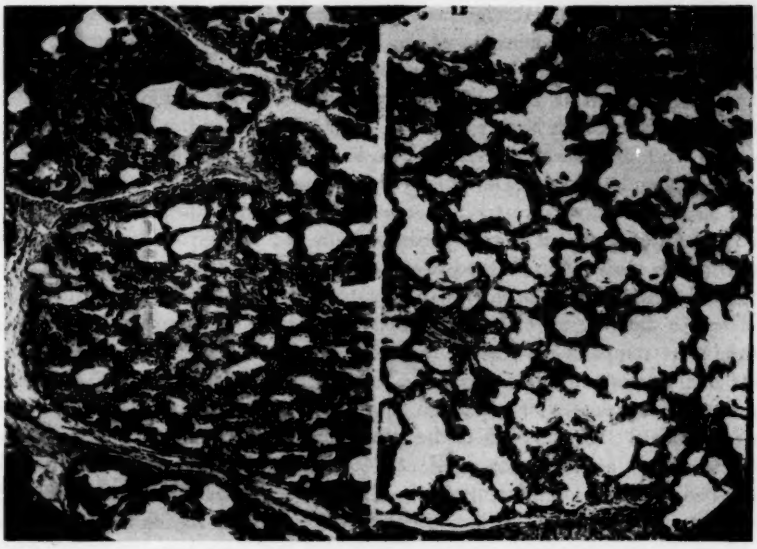
BEFORE AFTER

FIG. 3. Lung of infant with birth weight 2120 gm. dying at 30 min. Before expansion alveolar walls averaged 31μ and after expansion, 12μ. Lungs contained exudate, 4+; edema fluid, 1+; hemorrhage, 1+; cornified epithelial cells, 0; hyaline membranes, 0. Final pressure, 32 cm. of water.



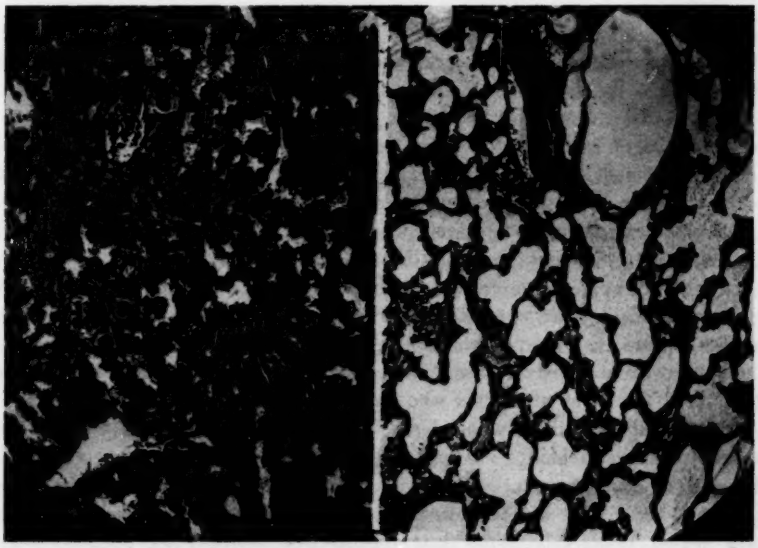
BEFORE AFTER

FIG. 4. Lung of infant with birth weight 2780 gm. dying at 5 hr. Before expansion alveolar walls averaged 26μ and after expansion, 14μ. Lungs contained edema fluid, 4+; hemorrhage, 4+; exudate, 2+; cornified epithelial cells, 0; hyaline membranes, 0. Final pressure, 29 cm. of water.



BEFORE AFTER

FIG. 5. Lung of infant with birth weight 1000 gm. dying at 74 hr. Before expansion alveolar walls averaged 36μ in width and after expansion, 34μ. Lungs contained edema fluid, 3+; hemorrhage, 0; exudate, 0; cornified epithelial cells, 0; hyaline membranes, 0. Final pressure, 25 cm. of water.



BEFORE AFTER

FIG. 6. Lung of infant with birth weight 3160 gm. dying at 12 hr. Before expansion alveolar walls averaged 52μ and after expansion, 33μ. Lungs contained hyaline membranes, 4+; edema fluid, 2+; cornified epithelial cells, 1+; exudate, 0; hemorrhage, 0. Final pressure, 30 cm. of water.

reveals that there was some foreign material remaining in the air spaces after expansion. Furthermore, the gross examination of the left and right lung did not suggest that any major differences were to be expected in the microscopic studies. For the sake of comparison, photomicrographs illustrating the poor expansion obtained in most of the lungs of premature infants with birth weights less than 1200 gm. and in the lungs of infants with extensive hyaline membranes are shown in Figs. 5 and 6, respectively. The greater thickness of the alveolar walls in both these lungs in spite of the fact that pressures of 25 and 30 cm. of water were applied, respectively, is seen in the reproductions.

The amount of time that elapsed between death and the performance of the autopsy or experiments appeared to bear no relationship to the expansibility of the lung, even though 24 hours elapsed sometimes before the postmortem was done and 60 to 70 hours passed before the experiments on expansion were performed. Usually much less time elapsed before completion of these procedures and without any apparent effect on the results. In this connection this experience parallels that of Wilson and Farber.[1]

In view of the degree of expansion that was obtained in the lungs of infants in Group 1, a special study was made of the autopsy protocols and clinical records of these 15 infants to determine the cause of death. One infant had congenital heart disease; another had laceration of the tentorium with an extensive subdural hematoma; a third had an extensive exfoliative dermatitis. These were the only significant anatomic findings except for the pulmonary changes. One infant died eight hours following birth to a mother with placenta previa and another infant died 30 hours after birth to a mother who had a second stage of labor lasting 70 hours. These were the only significant maternal complications reported in the group. This leaves 10 infants for whom no significant causes of death were found outside of the lungs.

Discussion

The pressures required to initiate expansion of the lungs in this study were similar to those reported by Wilson and Farber.[1] They found that negative air pressures equal to the weight of a column of water 35 cm. in height were sometimes necessary to overcome the initial resistance of the lungs, which they attributed to the cohesiveness of the moist surfaces of the air passages. The pressures used in this study to bring about apparent complete expansion were with only four exceptions well within the range which Smith reported newborn infants were capable of exerting.[2] The pressures used in the present study are important only because they were within the range which newborn infants are capable of exerting, and because they did not account for the differences in expansibility that were observed in the histologic studies. The differences in expansion appeared to be dependent on the findings in the lungs themselves.

The lungs containing extensive hyaline membranes could not be satisfactorily expanded. Neither could the lungs of infants who weighed less than 1200 gm. be expanded to the degree obtained in those whose birth weights were more than 1200 gm. The deficiencies in these two groups did not appear to be related to the presence of edema fluid, exudate, hemorrhage or amniotic sac contents in the air spaces, since it was repeatedly observed that in the absence of extensive hyaline membrane formation or a birth weight under 1200 gm. these foreign materials did not seem to interfere mechanically with good expansion of the lungs.

The manner in which hyaline membranes prevented expansion is not clear. The

hyaline membranes in the alveoli apparently were not mechanical barriers to expansion, for many of the hyaline-containing alveoli were emphysematous in the artificially expanded lungs. The fact that areas of emphysema and atelectasis were frequently seen in the same field from hyaline-containing lungs suggests that plugging of the alveolar ducts might have been the deciding factor. The bronchi, which were frequently collapsed in the unexpanded lung, were found to be patent in the artificially expanded lung. Hence, bronchial obstruction would not appear to have been responsible for the persistent atelectasis in the hyaline-containing lungs.

The use of increased positive intrapulmonary pressures or negative intrapleural pressures would seem to offer little hope in overcoming the persistent atelectasis in a lung containing extensive hyaline membranes. On the other hand, such pressures might be of the greatest use in lungs of newborn infants which contained only edema fluid, amniotic fluid, hemorrhage or exudate but not hyaline, even though these former materials were present in considerable quantity. Theoretically, at least, the lung of the newborn infant has the advantage of being in a state of relative atelectasis at birth. Such foreign materials as are present in the alveoli before complete expansion occurs should be considerably diluted during expansion by whatever gases are used. At the present time there is no way of determining which newborn infants have hyaline-containing lungs. Hence, there is no way of applying increased pressures on a selective basis. Since hyaline membranes are found in a high percentage of liveborn premature infants who die,[3] it is not to be expected that the use of pressure apparatus for resuscitation will have too appreciable an effect in lowering the mortality in the first few days of life, unless it can be shown that increased pressures prevent hyaline membrane formation. The lack of ability to select the infants who might benefit from the application of positive pressures may offer difficulties to the clinician. The possibility of producing mediastinal emphysema and pneumothorax in the infant whose lungs contain hyaline material would appear to be real. However, counterbalanced against that is the thought that there were 10 infants in Group 1 who might have materially benefited by a more vigorous effort to expand their lungs. There is a widespread feeling that blood, amniotic fluid, exudate and edema fluid produce atelectasis in the lungs of newborn infants by obstruction. The present studies suggest that perhaps too much emphasis has been placed on this possibility.

The immaturity of the newborn infant in terms of the stage of development of the lung has always been considered as a limiting factor in the survival of the infant. This has never been documented in specific terms. The small series of cases in the present study indicated that some infants with birth weights up to 1200 gm. have lungs which are incapable of being satisfactorily expanded because of their immaturity. The exact nature of the limiting factor in the lungs of these infants is not clear.

Summary

The lungs of 43 infants were removed at autopsy and expanded with measured amounts of negative pressure. The amounts of pressure required to initiate expansion and to bring about apparent complete expansion of the gross specimens could not be correlated with the final degree of expansion that was obtained as measured by the thickness of the alveolar walls. Expansibility of the lungs was impeded in two groups: those with a birth weight less than 1200 gm. and those who had extensive hyaline membranes

in the lungs. The presence of amniotic sac contents, blood, exudate and edema fluid in the alveoli and air passages, even in large amounts, did not mechanically prevent what appeared to be satisfactory expansion of the lungs.

References

1. Wilson, J. L., and Farber, S., Pathogenesis of atelectasis of newborn, Am. J. Dis. Child. **46**:590, 1933.
2. Smith, C. A., Physiology of Newborn Infant, Springfield, Ill., Charles C Thomas, Publisher, 1945.
3. Miller, H. C., and Jennison, M. H., Study of pulmonary hyaline-like material in 4117 consecutive births, PEDIATRICS **5**:7, 1950.

Spanish Abstract

La Significancia de Membranas Hialinas, Sangre, Exudados, Contenidos del Saco Anniotico y Fluido de Edemas, en la Prevención de la Expansión de los Pulmones de Niños Recién Nacidos

Los pulmones de 43 niños recién nacidos fueron removidos en la autopsia y expandidos con cantidades medidas de presión negativa. La cantidad de presión requerida para iniciar y producir la expansión completa aparente de los pulmones no pudo ser comparada con el grado final de expansion obtenida y medida en el grosor de las paredes alveolares. La expansibilidad de los pulmones fué prevenida-en dos grupos: aquellos con un peso al nacer de menos de 1200 gramos y el grupo sufriendo de membranas hialinas extensas en los pulmones. La presencia de contenidos del saco anniotico, sangre, exudados y fluido de edema en los alveolos y bronquios, aún en grandes cantidades, no previnieron mecanicamente la expansión satisfactoria de los pulmones.

University of Kansas Medical Center

PREVENTION OF TUBERCULOSIS AMONG CHILDREN WITHOUT THE USE OF BCG

By J. ARTHUR MYERS, M.D.
Minneapolis

THIRTY years ago a small group, including the late Chester A. Stewart, set to work to prevent tuberculosis among children in the city of Minneapolis. When this project later extended throughout Minnesota, veterinarians, nurses, social workers, physicians and, in fact, the public at large rallied to the cause. The most important problem that confronted us was to find the best method of protecting children against this disease. The tuberculosis mortality rate in 1916 in the state as a whole was 106.1 per 100,000 population. That year in Minnesota, with a total population of 2,262,558 there were 2,400 deaths, a preponderance of which occurred in homes where the victims during life were permitted to disseminate tubercle bacilli to the child population.

In 1920 only 130,155 cattle were tested with tuberculin. Dr. A. J. Chesley, Executive Secretary of the State Board of Health, wrote that there were 100,000 tuberculous cattle in Minnesota. He called attention to a city of 10,000 people in which the first testing with tuberculin revealed that 12% of cows kept within the city limits were infected with tubercle bacilli. In another community, with a population of 2000, every animal of a dairy herd which furnished 40% of the milk supply was condemned because of tuberculosis. Although a good deal had already been done to control the spread of the bovine type of tubercle bacillus, particularly in the large cities, there still remained much tuberculosis among cattle and many children were being infected by direct contact with animals as well as with their food products.

Some tuberculin testing had been done on small groups of children and from this it was estimated that more than 50% of girls and boys of grade school age in the cities were infected with tubercle bacilli. Indeed, as late as 1926 it was found that over 47% in this age period reacted to tuberculin in the city of Minneapolis.

The best method of preventing tuberculosis among children had to be developed in the face of numerous theories and controversies. A preponderance of physicians firmly believed that a tuberculin reaction was an asset because it was thought that the infected child who appeared healthy had immunity or resistance which would protect against clinical tuberculosis in adulthood. It was even said that children who reacted to tuberculin could be practically disregarded, whereas those so "unfortunate" as to be nonreactors should be watched most carefully, for they were "in great danger" of developing clinical tuberculosis should they become infected.

Thirty years ago many physicians believed the bovine type of tubercle bacilli was of such low virulence that it was relatively harmless to children. Therefore it was thought to be an ideal immunizer or resistance-builder to virulent forms of tubercle bacilli.[1] This theory was actually used to oppose the veterinarians' program to eradicate tuberculosis from

From the University of Minnesota Medical School, Minneapolis.

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the cattle herds since this would deprive children of the so-called immunizing power of the bovine type of tubercle bacillus! Some physicians even opposed the isolation of persons with tubercle bacilli in their sputa because they thought all children should receive immunizing doses of the human type of tubercle bacillus.

Ever since Koch had announced the discovery of the tubercle bacillus, physicians, including Koch himself, hoped to produce an efficacious vaccine which would protect against clinical tuberculosis. Indeed, by 1920 scores of people had literally produced dozens of so-called immunizing agents, each of which had been loudly acclaimed as to its efficacy.

These included tuberculin and extracts of tubercle bacilli, employed not only by Koch but also by such physicians as Birnbaum, Kapralik and Von Schrotter. Attempts were made to produce immune sera in many ways and by numerous workers, including Richet, Babes, Vicqueret, Schweinitz and Dorset.

Tubercle bacilli killed or modified by various physical and chemical agents were employed by a large number of physicians. For example, Marngliano killed the bacilli he used by heat and introduced them by the scarification method. Others administered these dead bacilli subcutaneously, intraperitoneally and by mouth.

Some scientists and physicians, such as Calmette, Gúerin, Vallée, Much and Kleinschmidt, used bacillary lipoids and bacilli treated with lipoid solvents. Many others treated tubercle bacilli with chemical reagents to attenuate virulence or destroy their vitality. For this, Moussu employed Javel water; Vallée, iodine water; Rappin, sodium fluoride; Noguchi, ammonium oleate; Levy and others, glycerine, urea and galactose. Many other substances were used.

Di Donna produced a preparation of tubercle bacilli killed by exposure to sunlight which he thought might have some special immunizing qualities.

Cavagnis, in 1886, apparently was the first to attempt to produce immunity by introducing living tubercle bacilli. Following this, large numbers of workers used live tubercle bacilli, varying from those extremely virulent to those markedly reduced in virulence. Among these workers were Grancher, Martin, von Behring, Koch, Calmette and Webb. In fact, von Behring promised the world freedom from tuberculosis through the use of his vaccine.

Avian type of tubercle bacillus, as well as that of cold-blooded animals, were used by such persons as MacFadyean and Friedmann.

Nocard in 1902 isolated tubercle bacilli from the udder of a tuberculous cow. This organism, later known as BCG, was attenuated by Calmette and Gúerin and had been in the limelight before our program was begun, but its use was limited to animals. Within the next two years it was first administered to babies in France, after which Calmette made claims so extravagant that many workers accepted them with inconclusive evidence. We were subjected to considerable pressure in the early 1920's to adopt an immunizing agent, especially BCG.

In an environment of numerous controversies and theoretic considerations, a good deal of analytic work had to be done. The course of procedure finally decided upon was to combat the tubercle bacillus, regardless of degree of virulence, so-called immunizing or resistance-building powers. It was our belief that from the standpoint of tuberculosis, the greatest asset to the human body was total freedom from tubercle bacilli. In any event, this method seemed worth while since everything else that had been tried in the control of tuberculosis in history had failed.

Already a great deal of work had been done to support such a program. For example, a fine sanatorium building project had just been completed. Not enough beds were available but it was hoped that they could be sufficiently increased. The State Board of Health and the veterinarians since 1894 had been trying to rid dairy products, particularly for the larger cities, of tubercle bacilli through tuberculin testing of cows and pasteurization of milk. The momentum of their program was constantly increasing and state-wide eradication of tuberculosis among cattle was in the offing. Everywhere the watchword was "Protect the child from infection with tubercle bacilli."

Soon after this work began, the tuberculin test was recognized as the only method of detecting tuberculosis early. The presence of primary lesions can be determined by this

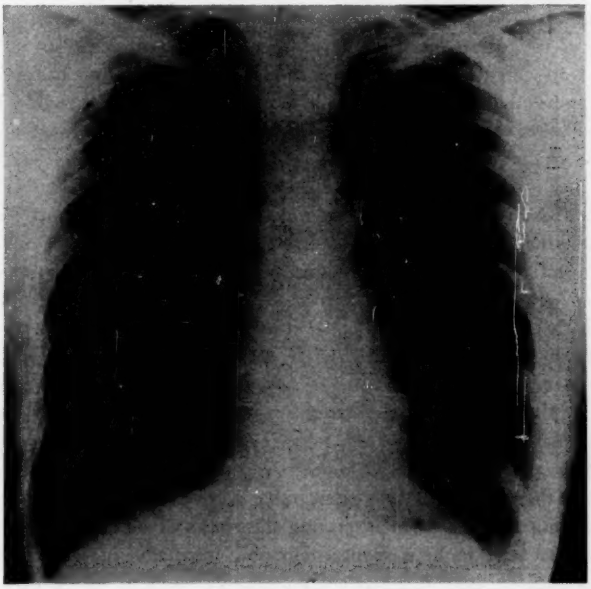

FIG. 1

test within 3 to 7 weeks after tubercle bacilli invade the child's tissues. The tuberculin test, therefore, was considered the best diagnostic agent. By a characteristic reaction alone does one safely make a diagnosis of at least primary tuberculous lesions containing living tubercle bacilli. At the same time, the physician learns that the child has been in contact (often direct) with a person—nearly always an adult—who has contagious tuberculosis. Careful examination of the adult associates of the child, such as immediate relatives and school personnel, frequently reveals the person responsible for the child's infection. Thus the tuberculin test is by far our best case-finding device. If cases so found are properly managed, the already infected children may be protected against further exogenous reinfections, which are dangerous, and the other children of the vicinity may be protected against infections and reinfections. For example:

In 1944, during routine tuberculin testing in a school, a girl 9 years of age reacted to tuberculin. Chest roentgenogram revealed no evidence of disease. Complete examination

was negative for extrathoracic lesions. In seeking the source of her infection, the parents reacted to tuberculin. The mother had no evidence of clinical tuberculosis, but the chest roentgenogram of the father (figure 1) revealed evidence of disease in both upper lung fields. His sputum, which he said was only cleared from the throat, contained numerous tubercle bacilli. Although he apparently was in good health, he entered a sanatorium. While there he had no significant symptom. It has been impossible to convert his sputum, hence he is still unemployable because of contagion, although he is apparently in excellent general health. In all probability he would have continued to work and disseminate tubercle bacilli during the past six years if his daughter had not been tested with tuberculin.

The tuberculin test affords the only accurate and dependable method of determining how well children are being protected. For example, if one tests all children in a community before a preventive program is instituted and periodically thereafter and finds the incidence of reactors among those born since the program began lower than those of the same age who were tested before the program was instituted, one has the best possible evidence that preventive measures are succeeding. The tuberculin test enables one to find in the child population those who should be periodically examined, always including x-ray film inspection of the chest as adulthood is being attained and thereafter.

Anything, including BCG, that nullifies the use of the tuberculin test, such as artificially sensitizing the tissues of children or promoting false propaganda against the test causing parents to deny their children its benefits or older children to refuse it, robs the physician of his most potent weapon in diagnosis: discovering sources of infection and determining effectiveness of tuberculosis control measures.

We found that roentgenographic inspection plays a limited role in diagnosis of tuberculosis among children because 75% or more of the lesions of primary complexes never become large enough or sufficiently dense or are so located as to be detected by chest roentgenogram. However, when reinfection forms of tuberculosis develop, such as lesions of bones and joints, tuberculous pneumonia, and in young adults, chronic pulmonary lesions, roentgenography becomes extremely helpful in determining their location and to some degree their extent. The greatest value of the x-ray film in the prevention of tuberculosis among children is in inspecting the chests of adult associates suspected of having this disease and in mass roentgenographic inspection of large segments of the population.

The laboratory has played an important role in prevention of tuberculosis among children. Although children rarely develop the chronic reinfection type of pulmonary tuberculosis, about 25% of those who have primary infiltrates demonstrable by the shadows they cast on x-ray films may temporarily have tubercle bacilli in the stomach washings. Such children rarely cough or expectorate and therefore are not regarded as contagious unless acute bronchitis co-exists. Tubercle bacilli may exude from cutaneous sinuses from lesions of bones and joints, lymph nodes, etc. The main role of the laboratory is to find tubercle bacilli in the sputum, gastric or bronchial washings of adult contacts of children. Persons found to be eliminating tubercle bacilli should have no further contact with children until their disease is well controlled.

As our observations continued we found no support for some of the theories with which we were frequently confronted. For example: 1. the belief that tuberculous infection manifested by the tuberculin reaction immunized or afforded adequate resistance against clinical forms of the disease in adulthood proved to have no foundation. The belief that infected children walk in a charmed circle of safety was replaced with the fact that they

walk within the circle where a great deal of illness, much destruction and even deaths occur from tuberculosis. When tuberculin-reacting children who appeared entirely well attained adulthood, we saw them contributing significantly to the group of the ill and dying, whereas those who remained nonreactors enjoyed entire freedom from tuberculosis.

An example of the former was an apparently healthy child of six years who was examined in 1928 because of contact with an adult who had contagious tuberculosis. She reacted to tuberculin and the roentgenogram of her chest revealed evidence of calcification in the left lung parenchyma and hilar region (figure 2a). The parents were told that the tuberculin reaction indicated the presence of immunity and therefore subsequent examinations were unnecessary. Twelve years later, at the age of 18 years, she fell ill. Examination

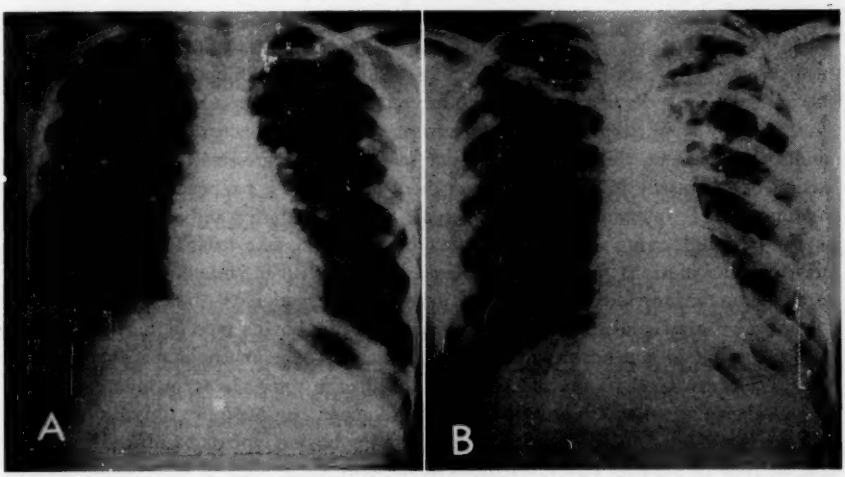

FIG. 2 A and B

revealed evidence of extensive disease in both lungs (figure 2b) and tubercle bacilli were abundantly present in her sputum. After approximately five years of strict bed rest, left extrapleural thoracoplasty was performed. Now (1950) she is taking four hours of exercise daily, but is not yet able to work. Thus, 11 years of her life have been ruined because the tuberculin reaction at the age of 6 years was thought to be a criterion of immunity. We have seen enough similar cases to justify the statement that the healthy child who reacts to tuberculin today may be the adult contagious consumptive of tomorrow.

Our goal, therefore, continued to be freedom from tubercle bacilli for all children.

2. A theory was extant to the effect that the individual who did not become infected in childhood but acquired tubercle bacilli in adulthood was totally lacking immunity or resistance and therefore would develop rapidly progressive and fatal tuberculosis. Those who adhered to this theory thought that it would be impossible for anyone to pass many years in adulthood without becoming infected. In effect, then, it was argued that every child should be infected so as to enter adulthood with tissues sensitized to tuberculoprotein.

When it became obvious that the majority of our children were entering adulthood as nonreactors to tuberculin, theorists expressed intense alarm as they were so convinced that

such persons were headed for destruction. In fact, pressure was exerted to find all children and young adults who did not react to tuberculin and sensitize their tissues to tuberculoproteins by producing tuberculous lesions in them with BCG, which Calmette and Gûerin were strongly recommending in France.[2] We could see no premise for such a procedure. It had already been established that a natural infection with virulent tubercle bacilli did not produce dependable immunity or resistance against later attacks of clinical disease. Thus it could hardly be expected that an organism of low virulence would do so. Moreover, we sought to avoid tuberculous lesions rather than produce them, even with an organism of low virulence. Furthermore, it had been established that destructive forms of clinical tuberculosis, both acute and chronic, usually develop in tuberculin reactors.

As the years passed, we had the opportunity to determine the validity of the belief that infections acquired first in adulthood are likely to promptly result in rapidly progressive tuberculosis. We saw several hundred young adults, particularly students of nursing and medicine, acquire primary tuberculosis. These individuals exhibited the same defense mechanism against the first invasion with tubercle bacilli that we had seen in so many children. There was no essential difference between the primary tuberculous lesions of young adults and those of children. We did not see rapidly progressive tuberculosis develop among our primarily infected adults any more often than it happened among children. As time passed, we saw older persons become primarily infected and they responded just as children and young adults. Therefore, the theory so long extant to the effect that primary tuberculosis is more dangerous in adulthood than in childhood proved to be a myth among the individuals of the groups under our observation.[3,4]

As evidence accumulated it became obvious that the bovine type of tubercle bacillus does not result in dependable immunity, but actually causes much incapacity and death among children. Griffith[5] and others pointed out that in some places, including England, where tuberculosis is still prevalent among cattle, more than 50% of clinical tuberculosis of superficial lymph nodes of children is due to the bovine type of bacillus. This is also true of 50% of patients with tuberculosis of the skin, about 25% of infants and children who die from acute tuberculosis such as meningitis and miliary disease, 20% of those with diseased bones and joints and the organs of the genitourinary system, and even 1 to 6% of those with pulmonary disease.[5,6] Thus prevention of tuberculosis among children was markedly facilitated by destroying tubercle bacilli, particularly in dairy products, by heat. In some places pasteurization played an important role. A far more dependable method consisted of controlling tuberculosis among cattle.

Veterinarians and their co-workers deserve a tremendous amount of credit for preventing tuberculosis among children in this manner. They found it was impossible to control tuberculosis among cattle with any of the so-called immunizing agents, including BCG.[7] However, they won the world's greatest victory over tuberculosis to date by testing all cattle periodically with tuberculin and slaughtering the reactors.[8] In the United States, between 1917 and 1950 they administered 322,474,607 tuberculin tests to cattle and slaughtered the 3,978,763 reactors. They have so nearly eradicated tuberculosis from cattle that in 1950 when 9,439,811 were tested, only 0.187% reacted to tuberculin.

Minnesota veterinarians were administering the tuberculin test to cattle in the 1890's. During 1934, they tested 1,597,995 cattle. The state was accredited by 1935, that is, the disease had been so reduced that only 0.5% or less of the cattle reacted to tuberculin. Sample testing in 1948 revealed only 0.09% tuberculin reactors. Along with the tuberculosis eradication campaign among cattle there was a corresponding tumbling-down

of mortality, morbidity and infection attack rates among children. It has become rare here for a child to be infected with the bovine type of tubercle bacillus through association with cattle or by consuming their food products.

The program early adopted consisted of the tuberculin test as our sheet anchor, roentgenographic inspection of the chests of tuberculin-reacting adults to detect gross lesions, searching for tubercle bacilli by bacteriologic methods, isolating and treating contagious cases and preventing others from becoming so, and controlling the disease among animals, particularly cattle. This has resulted in a phenomenal tumbling-down of tuberculosis both among people and cattle, which has been reflected in lowered mortality, morbidity and infection attack rates. While 2400 citizens of the state died from tuberculosis in 1916 when the population was 2,262,558, only 410 died in 1949 when the population was slightly less than 3,000,000. The number of deaths and mortality rates among children and young adults in 1916, four years before our program began, and in 1949 are as follows:

	Birth to 1 yr.		Birth to 15 yr.		10 to 19 yr.	
	No. Deaths	Rate	No. Deaths	Rate	No. Deaths	Rate
1916	68	140.4	275	38.3	268	60.4
1949	2	4.4	9	1.3	7	1.4

During 1949 only 15 girls and boys from birth to 19 years died from tuberculosis. Of 410 deaths in 1949, 63.2% were 50 years old or over; 30.75% were 65 or older (chart 1).

We believe the relatively high mortality rate among elderly persons is largely due to residuals of lesions which they contracted earlier in life. When they were infants, children or even young adults, almost nothing was done to protect them against infection with either the human or bovine type of tubercle bacillus. Many developed primary tuberculosis complexes. In some, the lesions of these complexes such as caseous lymph nodes have contained living tubercle bacilli through the years and decades, which in later life resulted in incapacitating and killing tuberculosis.

It has been suggested that these older people have recently been infected by exposure to contagious tuberculosis. However, this seems most unlikely because we do not often find among their contacts persons who might have been reinfecting them. Moreover, if our older people were being infected and reinfected from contagious cases, we cannot conceive that such contagion would not be reflected in an extensive way in the younger members of the population, including children. Our older people have intimate and extensive contact with their grandchildren and great-grandchildren. They also have numerous and intimate association with children and young adults besides those of their own families. Despite this constant mingling of the people of older and younger generations, the mortality rate in children and young adults has decreased to almost unbelievable low levels.

There has also been a marked decrease in morbidity, especially among children and young adults. It has become difficult to find enough children with clinical tuberculosis to adequately teach students of nursing and medicine. A few decades ago, 50% or more of the children admitted to hospitals for the crippled had such crippling from tuberculosis; the incidence is now 5% or less. Many teen-aged girls and boys were found to be suffering from tuberculosis in our sanatoriums and hospitals 30 years ago. Today they are relatively rare. The average age of patients admitted to our sanatoriums has increased. In some institutions this has now reached 50 years or older.

Fifteen years ago there were long waiting lists of tuberculous patients for sanatorium beds. For the past few years there have been from 300 to 600 beds vacant for lack of patients. In fact, some small sanatoriums are now being closed.

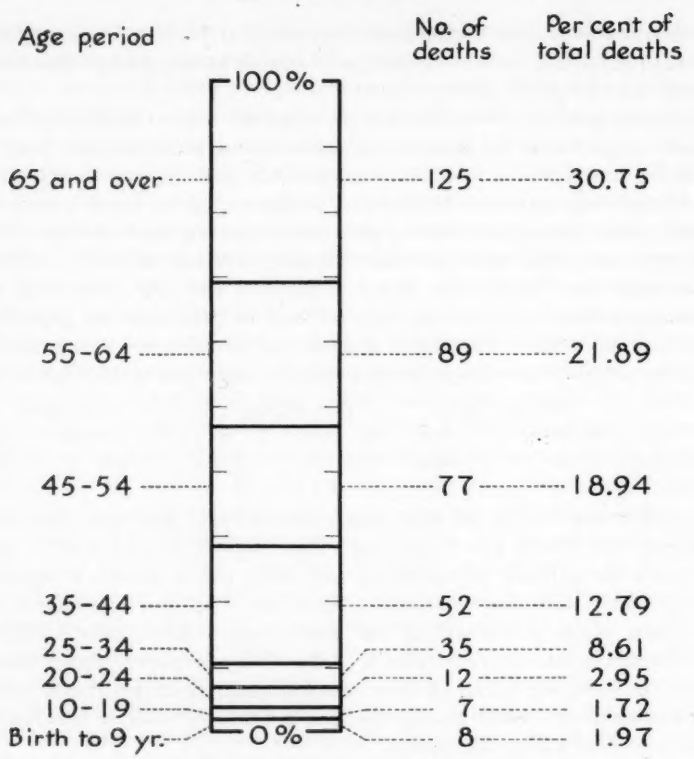

CHART 1. Mortality from Tuberculosis—Minnesota 1949

(Note low tuberculosis mortality rates from birth to 24 yr., and high rate among those of 65 yr. and over. The state's total population is slightly less than 3,000,000.)

The best criterion of the effectiveness of the tuberculosis control program is found in the lowered incidence of tuberculin reactors among children. Every child who reacts to tuberculin has taken tubercle bacilli into his body, usually from a contagious case in his environment. Inasmuch as the child prior to adolescence usually does not have chronic contagious pulmonary tuberculosis, most often infections in children are acquired from adults. Therefore, the more child reactors to tuberculin in a given community, the larger the number of adults who have been allowed to remain in that area with contagious tuberculosis. An exception may be when one or only a few persons with contagious tuberculosis, such as teachers and other members of school personnel, have contact with large numbers of children. Therefore, wherever the incidence of tuberculin reactors among children is decreasing, the supply of free tubercle bacilli in their environment is diminishing. This usually means that adults with contagious tuberculosis are being found and not permitted to disseminate their tubercle bacilli among children. Others are being discovered before their disease is contagious and is prevented from becoming so.

The effectiveness of these procedures in practice in preventing tuberculosis among children has been clearly demonstrated by periodic tuberculin testing. Among grade school children in the largest city of the state, 47.3% reacted in 1926, 18.9% in 1936

and 7.7% in 1944.[9] The annual infection attack rate in this city was reduced from approximately 3% in 1926 to 0.3% in 1944. In the village and country schools about 2 to 3%, rarely 5%, of grade school children react to tuberculin. In fact, Jordan[10] reported that in 1948 in a four county sanatorium district with 277 schools there were 219 with a total enrollment of 3900 children in which no child reacted to tuberculin. Thus, tuberculosis has been completely eradicated at the grade school age level in this area. Among the senior students in high school tested in various counties in the state, the incidence of tuberculin reactors has ranged from 4 to 8%. At the University of Minnesota there was a gradual decrease in the incidence of reactors among entering students from approximately 33% in 1928 to 6.4% in 1945.

In the school of medicine, 65% of those who entered as nonreactors to tuberculin in 1932 became reactors by the time of graduation in 1936. However, only 3.2% of those who entered as nonreactors in 1943 were reactors in 1947.[3] In a school of nursing, in which all students who entered as nonreactors to tuberculin became reactors by the time of graduation in the 1920's and early 1930's, no student who entered the school as a nonreactor to tuberculin in 1942 became infected by the time of graduation in 1945.[4] Thus, the same methods that are so effective in preventing tuberculosis among children are equally so when extended to adults.

Reasons for Not Using BCG

When we were faced with the development of a tuberculosis prevention program among children and young adults 30 years ago, we did not adopt any of the so-called immunizing agents, because by them no one had accomplished the results we desired to attain.

The highly virulent strain of bovine type of tubercle bacillus, isolated by Nocard in 1902 and reduced in virulence by Calmette and Gúerin, was named BCG (Bacillus Calmette-Gûerin) in 1921. Calmette declared it a permanently "fixed virus" in 1924. It was used only among animals, especially cattle, until 1922 when it was first introduced into the bodies of babies in France. Calmette claimed that it would absolutely protect babies against tuberculosis from virulent forms of tubercle bacilli.[2] His claims were extravagant, but no more so than those of von Behring for a so-called vaccine consisting of living tubercle bacilli, which he had introduced at the beginning of the century. Exorbitant claims had been made by others, including Koch, for live bacilli vaccines which they had prepared. None had succeeded in doing more than rendering the tissues of animals or people allergic to tuberculo-protein. A temporary reduced spread of tubercle bacilli as a result of the allergy deceived the workers, as they thought this indicated immunity. BCG also renders the tissues of animals and people allergic to tuberculo-proteins and this was also interpreted as indicating the presence of immunity. Thus Calmette apparently was accomplishing no more than his dozens of predecessors whose so-called vaccines had failed.

When our observations revealed that tuberculous infections in childhood do not dependably immunize against clinical tuberculosis in adulthood,[11] we could see no premise on which to base a so-called artificial immunization program. Calmette, his co-workers and disciples never convinced us that BCG might not regain its virulence and again cause destructive disease in animals and people. Throughout our entire 30 years of work, we have refrained from using BCG, vole tubercle bacillus or any other so-called immunizing or "resistance-building" agent.

We do not now recommend BCG or any other living tubercle bacillus of reduced viru-

lence in the prevention of tuberculosis among children or adults for the following reasons:

1. The methods we have employed over the last 30 years have produced far better results than have been achieved anywhere in the world by the use of BCG.[12]

2. Veterinarians and their allies in this country conducted thoroughgoing studies on BCG among cattle, following which it was discarded for lack of efficacy.

3. Claims made with reference to the efficacy of BCG in preventing tuberculosis among children and young adults, particularly among students of nursing and medicine, are for the most part based upon studies inadequately controlled or of insufficient duration to justify conclusions.

4. It has been said that the immunizing or "resistance-building" powers of BCG are no better than those produced by natural infections with virulent tubercle bacilli. Since natural infections do not result in dependable immunity, it seems poor logic to introduce something artificially that is no better.[13]

5. The claim has been made that BCG is capable of preventing 60 to 80% of tuberculosis among people. Analyses of reports reveal that this applies only to those conditions which appear soon after allergy is established by natural infection, such as erythema nodosum, primary pulmonary infiltrates, enlargement of hilum structures, and occasional cases of meningitis, miliary disease or tuberculous pneumonia. These conditions constitute only about 3% of the tuberculous manifestations in our area. The remaining 97% appear at a much later time after allergy is acquired. There is no evidence that BCG would afford significant protection against destructive forms of tuberculosis which constitutes about 97% of our problem.

Heimbeck, in 1927, began making careful observations on tuberculosis among students of nursing in the Ullevaall Hospital in Oslo. They were divided into three groups: (1) those who entered school as reactors to tuberculin; (2) those who entered as nonreactors and accepted BCG; (3) those who entered as nonreactors and refused BCG. These nurses were traced after graduation, and his 1948 report[14] showed that there was no great difference in morbidity and mortality among the nurses in the three categories. Wallgren,[15] who strongly recommends BCG for children, says: "In my opinion, there is no evident prophylactic influence on the development of late manifestations of post primary tuberculosis."

6. The virulence of BCG is not fixed. In fact, when grown on certain kinds of media it becomes dangerously virulent. Jensen[16] states that the virulence of BCG changes and that if the strain becomes too virulent, abscesses develop among those who receive it with alarming effects.

Dubos,[17] Rockefeller Institute for Medical Research, says "that one of the BCG strains commonly used for immunization can cause severe pulmonary disease (and sometimes death) when injected in sufficient amounts into mice maintained on deficient diets."

Vorwald et al.[18] have demonstrated "conclusively that the BCG strain organisms used in this study can produce progressive and fatal pulmonary tuberculosis in guinea pigs whose tissue resistance has been modified by the inhalation of quartz dust."

Since silicotic animals and those on deficient diets develop progressive tuberculosis from BCG, one wonders what other pathologic and physiologic states may permit BCG to produce progressive tuberculosis. Certainly until more is known about BCG, its possible dangers in humans must still be considered.

The often repeated statement, that BCG has been administered to 50,000,000 or more

humans without harm to one, lacks convincing evidence. An extremely small fraction of 1% of them has had acceptable subsequent observation. A good many have later developed clinical tuberculosis, and more than an insignificant number of deaths have occurred. The number of necropsies with bacteriologic studies, including typing of bacilli, is most disappointing.

Vorwald et al.[18] have shown that BCG lives at least 18 months in guinea pigs. Whether they live for longer periods has not been determined. No one knows how long they remain alive in human tissues and what the remote potentialities for causing progressive tuberculosis may be.

7. In Rio de Janeiro between 1945 and 1948 mortality from tuberculosis decreased 29.2%. Fewer deaths among those of 20 years and over were responsible for most of this decrease. In the age period where BCG has been extensively used, mortality rates rose sharply between 1945 and 1948.[19] This increase was 41.3% among infants from birth to 1 year, 62.5% among those from 1 to 2 years and 15.9% among those from 2 to 4 years. Apparently BCG was the only addition to the tuberculosis control program among infants and children of this area. What percentage of this increase in mortality occurred among the vaccinated and how much among the unvaccinated was not reported. However, the question is did the BCG become virulent or was the sense of false security responsible?

Every favorable report made on the use of BCG can be matched by equally good or better results from areas where it has not been used.[20] For example, Levine[21] has pointed out that in New York City, where BCG has not been used, tuberculosis mortality in children compares quite favorably with that in Gothenberg, Sweden, where practically all infants exposed to tuberculosis were given BCG, but "where practically no control material was available." In Japan the mortality rate decreased from 280 per 100,000 population in 1945 to 181.1 in 1948. Sams[22] maintains this decrease was largely due to BCG, but he presents no well documented evidence to justify his belief. During the same years in Rio de Janeiro the tuberculosis death rate decreased from 342 per 100,000 population to 242. Nearly all the reduction occurred among adults who had not received BCG. In Iceland tuberculosis mortality decreased from 200 per 100,000 population in 1930 to 34 in 1948 without the use of BCG.[23] No role has been played by BCG in the United States, and yet this country has the lowest mortality rate of any nation of 25,000,000 population or more. Here, the rate has decreased from nearly 200 per 100,000 at the opening of the century to 26.1 in 1949 and an estimated 23 in 1950.

In the Scandinavian countries, where BCG has been extensively used, tuberculosis mortality has been decreasing, but no faster than in similar populations where BCG has not been employed. The states of Wisconsin and Minnesota each have about the same population as Denmark and Norway, but without BCG their mortality rates are definitely lower than the Scandinavian rates. The population of Minnesota, for example, is approximately the same as that of Denmark (3,000,000). Over 60% of her citizens are of Scandinavian extraction. In 1949, the mortality rate in Denmark was said to be 19 per 100,000 and in Minnesota it was 13.6.

Levine and Sackett[24] have called attention to the numerous factors involved in the reduction of tuberculosis, all of which must be properly evaluated. The addition of BCG in an area where the disease is decreasing as the result of other factors already in operation should result in a much more rapid decrease if the claims for its efficacy are true. To date such a report has not been forthcoming. There is no reliable evidence to prove that BCG

has significantly reduced morbidity and mortality from tuberculosis in any nation.

8. It has been recommended that BCG be used only as an adjunct to the fundamental methods which have been so effectively employed. This is not possible because BCG and these methods are incompatible. BCG nullifies the tuberculin test, which is indispensable in the fundamental methods. Moreover, the sense of false security which BCG creates partially destroys public support so necessary in any tuberculosis control program.

9. On September 7, 1946, the Division of Tuberculosis of the United States Public Health Service called a conference on BCG, when it was agreed that there has never been a well controlled study conducted sufficiently long to justify conclusions concerning the efficacy of BCG in man. A resolution was passed, recommending such a study by the United States Public Health Service. This study is in progress in Georgia, Puerto Rico and the Virgin Islands. It is being so well conducted that we are strongly supporting it. However, we are in no position to recommend the use of BCG under any circumstance unless this study conclusively proves that it is harmless and more efficacious than the fundamental methods which have proved so effective.

Summary

A serious tuberculosis problem still existed in 1920 in many parts of the United States, including Minnesota. Here, approximately 50% of grade school children had primary tuberculosis as manifested by the tuberculin reaction. Clinical extrathoracic tuberculosis was not uncommon among infants and children. Many teen-aged girls and boys died from chronic pulmonary disease. Tuberculosis was prevalent among cattle and many children contracted the disease from them.

Numerous methods of attempting to immunize children against tuberculosis that had been introduced since 1882, including BCG, were carefully studied, but none had proved sufficient to aid in accomplishing the goal we wished to attain. Veterinarians conducted thoroughgoing studies on various so-called immunizing agents, including BCG, among cattle, but all were discarded for lack of efficacy.

The method adopted to control tuberculosis among children consisted of dealing with it as a contagious disease. Children were protected against contagion by isolating and treating adults with open tuberculosis in hospitals and sanatoriums. Many tuberculin testing surveys were conducted and the reactors completely examined, including x-ray film inspection of their chests, particularly the adults. Those with no clinical disease at the moment were periodically examined. Veterinarians practically eradicated tuberculosis from the animal herds.

This fundamental method of control resulted in a tumbling-down of tuberculosis mortality, morbidity and infection attack rates. The mortality rate for all ages dropped from 106.1 (2400 deaths) in 1916 to 13.6 (410 deaths) in 1949. Among infants from birth to 1 year, the mortality rate was 140.4 (68 deaths) in 1916, but only 4.4 (2 deaths) in 1949. Among children from birth to 15 years, the rate was 38.3 (275 deaths) in 1916 and only 1.3 (9 deaths) in 1949. In the age period 10 to 19 years, the mortality rate was 60.4 (268 deaths) in 1916, but only 1.4 (7 deaths) in 1949. Morbidity rates decreased so that in our sanatoriums with long waiting lists in the 1920's, there were 300 to 600 vacancies in the early 1940's, and in 1950 some smaller institutions were closing.

The incidence of primary tuberculosis (tuberculous infection) among grade school children in the largest city decreased from 50% in 1920 to 8% in 1944. There are now many village and rural schools in which no child reacts to tuberculin.

We do not now use or recommend BCG because:

1. The accomplishments by fundamental methods have not been even remotely approached any place in the world where BCG has been used.

2. In places where BCG has been added and tuberculosis mortality has been decreasing, the fundamental methods have also been employed. There is good reason to believe the decrease has been due to the fundamental methods and not to BCG.

3. BCG nullifies the tuberculin test, our best diagnostic and epidemiologic agent.

4. Harmlessness of BCG has not been proved. Indeed, it may be definitely harmful since it is known to kill silicotic animals and those on deficient diets.

5. Attacks of primary or reinfection types of tuberculosis by virulent tubercle bacilli do not result in dependable immunity. Therefore, attempts to produce immunity by establishing lesions with BCG are on a shaky premise.

References

1. Lochead, D. C., Bovine tuberculosis as public health problem, J. Am. Vet. M. A. **72**:823, 1928.
2. Calmette, A., and Weill-Halle, B., Vaccination of newborn infants against tuberculosis with BCG process, Transactions of the Twenty-second Annual Meeting, National Tuberculosis Association, 1926.
3. Diehl, H. S., Boynton, Ruth E., Geist-Black, Susanna, and Myers, J. A., Prevention of tuberculosis among students of medicine, J.A.M.A. **138**:8, 1948.
4. Myers, J. A., Boynton, Ruth E., and Diehl, H. S., Prevention of tuberculosis among students of nursing, Am. J. Nursing **47**:661, 1947.
5. Griffith, A. S., Bovine tuberculosis in man, Tubercle **18**:529, 1937.
6. Hedvall, E., Bovine tuberculosis in man: Clinical study of bovine tuberculosis, especially pulmonary tuberculosis, in southernmost part of Sweden, Acta med. Scandinav., 1942, supp. 135, p. 239.
7. Watson, E. A., Bovine tuberculosis and BCG vaccination, Twelfth International Veterinary Congress, Washington, D.C., Government Printing Office, 1935.
8. Myers, J. A., Man's Greatest Victory Over Tuberculosis, Springfield, Ill., Charles C Thomas, Publisher, 1940.
9. Harrington, F. E., Evolution of Tuberculosis as Observed Over Twenty Years at Lymanhurst, Minnesota Tuberculosis and Health Association, St. Paul, Minn., 1941.
10. Jordan, L. S., Eradicating tuberculosis in rural Minnesota, Dis. of Chest **14**:261, 1948.
11. Ch'iu, P. T. Y., Myers, J. A., and Stewart, C. A., Fate of children with primary tuberculosis, J.A.M.A. **112**:1306, 1939.
12. Myers, J. A., Invited and Conquered, Minnesota Public Health Association, St. Paul, Minn., 1949.
13. Medlar, E. M., Prophylactic (BCG) vaccination to control tuberculosis, J.A.M.A. **141**:593, 1949.
14. Heimbeck, J., BCG vaccination of nurses, Tubercle **29**:84, 1948.
15. Wallgren, A., Principles of BCG vaccination, Lancet **1**:237, 1948.
16. Jensen, A., Practice of Calmette's vaccine, Acta tuberc. Scandinav. **20**:1, 1946.
17. Dubos, R. J., Immunological aspects of BCG vaccination, Am. Rev. Tuberc. **60**:670, 1949.
18. Vorwald, A. J., Dworski, M., Pratt, P. C., and Delahant, A. B., BCG vaccination in silicosis, Am. Rev. Tuberc. **62**:455, 1950.
19. deAbreu, M., Early diagnosis and treatment in tuberculosis prophylaxis, Dis. of Chest **19**:249, 1951.
20. Dickey, L. B., BCG controversy, Dis. of Chest **18**:502, 1950.
21. Levine, M. I., and Hertzberg, G., Achievements of BCG vaccination, Book Review, Am. Rev. Tuberc. **60**:675, 1949.
22. Sams, C. F., Medical care aspects of public health and welfare in Japan, J.A.M.A. **141**:527, 1949.
23. Anderson, R. J., and Palmer, C. E., BCG, J.A.M.A. **143**:1048, 1950.
24. Levine, M. I., and Sackett, Margaret F., Results of BCG immunization in New York City, Am. Rev. Tuberc. **53**:517, 1946.

SPANISH ABSTRACT

Prevención de la Tuberculosis Infantil sin el Uso del BCG

El autor destaca que en el año 1920, la tuberculosis aún representaba un serio problema en muchas partes de los Estados Unidos, incluyendo Minnesota. Aproximadamente 50% de los niños atendiendo las escuelas elementares de Minnesota, sufrian de tuberculosis primaria de acuerdo con la reacción a la tuberculina. La tuberculosis clinica extratoracica era frecuentemente observada en infantes y niños. Muchos adolescentes morian anualmente de tuberculosis pulmonar crónica. Igualmente, la tuberculosis era prevalente en el ganado vacuno, de los cuales muchos niños contraian la enfermedad.

En la opinión del autor, ninguno de los metodos de inmunización contra la tuberculosis en niños, introducidos desde el anõ 1882 incluyendo la vacuna BCG, han sido suficiente satisfactorios. Similarmente, los metodos de immunización usados contra la tuberculosis en el ganado han sido descartados por ineficaces.

El metodo adoptado en este estudio para el control de la tuberculosis infantil consistió fundamentalmente en enfocar la tuberculosis como una enfermedad contagiosa. Los niños fueron protegidos mediante la separación y tratamiento de los adultos con tuberculosis activa, en hospitales y sanatorios. Se realizaron numerosos "survey" con pruebas de tuberculinas y los casos positivos fueron examinados incluyendose radiografias de los pulmones, particularmente en los adultos. Los casos sin sintomas clinicos fueron examinados periodicamente. Igualmente, los veterinarios practicamente irradicaron la tuberculosis en el ganado.

Este metodo de control resultó en una disminución impresiva de la mortalidad, morbilidad y frecuencia de los ataques de la infección tuberculosa. La mortalidad para todas las edades bajó de 106.1 (2400 muertes) in 1916 a 13.6 (410 muertes) en 1949. La mortalidad en el primer año de vida, bajo de 140.4 (68 muertes) en 1916 a 4.4 (2 muertes) en 1949. El promedio de mortalidad se redujo de 38.3 (275 muertes) en 1916 a 1.3 (9 muertes) en 1949 en el grupo de niños entre el nacimiento y les quince años de edad. En el grupo entre los 10 años y 19 años de edad, la mortalidad bajó de 60.4 (286 muertes) en 1916 a solo 1.4 (7 muertes) en 1949. El promedio de morbilidad se redujo a tal extremo que sanatorios con lista de espera larga en 1920, ya en 1940 tenian 300 a 400 vacancias, y en 1950 algunas instituciones pepueñas han side clausaradas.

La incidencia de tuberculosis primaria (infección tuberculosa) entre los niños de escuela elementar en la ciudad mas grande del estado, disminuyó de un 50% en 1920 a un 8% en 1944. Actualmente existen numerosos pueblos pequeños y escuelas rurales en los cuales ningun niño reacciona a la tuberculina. El autor no recomienda el BCG por las siguientes razones:

1. Porque los resultados obtenidos por los metodos fundamentales no han sido ni aún remotamente aplicados en ningun sitio del mundo donde el BCG ha sido usado.

2. Porque en los lugares dende el BCG ha sido aplicado y en los cuales la mortalidad ha disminuido, tambien los metodos fundamentales han sido aplicados. El autor estima que hay buenas razones para creer que esta disminución en la mortalidad ha sido debida a los metodos fundamentales de control y no al BCG.

3. Porque el BCG nulfica la prueba de la tuberculina, la cual representa nuestro mejor agente diagnóstico y epidemiologico.

4. Porque la inocuidad del BCG no ha sido probada. Al contrario, el BCG puede ser actualmente nocivo, ya que es capaz de matar a los animales silicoticos y a aquellos con dieta deficientes.

5. Porque los ataques de infección primaria o de reinfección tuberculosa por bacilos virulentos no resultan en una inmunidad segura. Por consiguiente los atentados de producir una inmunidad mediante el establecimiento de lesiones tuberculosas con el BCG se basan en una premisa insegura.

University of Minnesota Medical School

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AMERICAN ACADEMY OF PEDIATRICS, INC. PROCEEDINGS AND REPORTS

THE PRESIDENT'S PAGE

SOME weeks ago I received a letter from a member of the Academy asking why the Advisory Committee of the American Board of Pediatrics had refused him permission to take the examination regularly offered in the subspecialty of Pediatric Allergy. The reason the Board of Pediatrics had given him, so he wrote, was that they considered he had not had sufficient training in allergy.

Recently also the Executive Board of the American Academy of Pediatrics has had criticisms of our society because, so it is stated, we allow another society to determine who our members shall be. We should abolish the regulation that Board membership should have anything to do with Academy membership. We should establish our own standards without reference to the standards of any other group.

Also recently, criticisms of the American Board of Pediatrics have been made to our officers. It is stated that too many well qualified pediatricians fail; that many have to wait years before they have a chance to take the Board examinations; that it is not right to ask an applicant who has failed his examination, has a good practice, a dependent family, to take a year more of training before he is eligible to take the examination again.

I shall take up these different implications and criticisms one at a time in this one letter, for they in a sense are all related.

In answering the question raised in the first paragraph, I called to the attention of the writer the fact that the Academy, as such, has no power, nor does it wish to assume any, over the policies of the American Board of Pediatrics. There is a mechanism provided, however, so that we can officially register opinions with the Board of Pediatrics. We appoint three of their nine members. They are not our legal representatives, but simply appointments, but they can and do register our opinions if the Executive Board of the Academy so desires.

It is pertinent at this point to review the origin of the American Board of Pediatrics and state its activities and objectives. In 1933, by joint action of the American Academy of Pediatrics, the American Pediatric Society, and the Pediatric Section of the American Medical Association, the Board was formed. Each of these societies appointed three mem-

bers to serve on the Board for a period of six years, and each has reappointed representatives as vacancies have occurred.

The activities of the Board may be described briefly. It establishes standards by which the competency of physicians to practice pediatrics may be estimated. It conducts examinations to test the ability of those who have fulfilled those standards. A third and exceedingly important activity of the Board is to evaluate the pediatric teaching facilities of hospitals, designating those which they approve as giving desirable pediatric training. This latter activity is carried on in conjunction with the Council on Medical Education of the AMA.

This, in short, gives the function of the American Board of Pediatrics. They determine those whom they consider possess sufficient pediatric information to call themselves pediatricians. The objectives of the American Academy of Pediatrics are this and a great deal more, as I pointed out in a previous letter, to which you might refer.*

Shortly after the organization of the American Board of Pediatrics, the Executive Board of the Academy approved, and the Academy membership in regular session voted, that with certain exceptions eligibility for membership shall be confined to those who have been certified by the American Board of Pediatrics.

The reason such a regulation was adopted was that the Academy had faith in the ability of the Board to determine the pediatric knowledge of the applicants. There were, however, other and more pressing reasons. It would cost the Academy a great deal of money to duplicate what the Board does. The latter and the AMA maintain a staff which we could not afford. When our numbers were small the Executive Board of the Academy attempted to do this. When applicants increased, it could not be done without help, and the Academy took the logical step of using the facilities of the Board of Pediatrics.

The Academy is not the only society that uses Board membership as one of the requirements for specialty society membership. For example, the American College of Physicians requires membership in the Board of Internal Medicine.

It should be emphasized that our constitution provides for that man who has not passed the Board examination, and this provision is frequently used. Applicants whose friends in the Academy believe them to be good material for Academy membership are submitted for Executive Board action and are frequently voted on favorably. This is one type of non-Board membership. Another type of non-Board membership which is frequently approved is that of members of other types of Boards, e.g., Surgery, Psychiatry, etc., but whose work is exclusively with children. To make these exceptions has been and undoubtedly will continue to be Academy policy.

It is definitely not the case that everyone that is certified by the American Board of Pediatrics is by that fact taken into our membership. It is not at all infrequent for the Academy to refuse applicants who are certified, because they are not considered desirable by the fellows in the Academy in their district. Objections to applicants are taken seriously, and if upon fair investigation by the District and State Chairmen involved, the objections are shown not to be based on personal animosity but a real disqualification, such applicants are not given membership.

What the American Academy of Pediatrics desires most is that its membership shall be the stamp of the best pediatrician. That this shall be the case, the Academy further requires that each applicant shall present two sponsoring letters from members in his area,

* PEDIATRICS 7:245 (Feb.) 1951.

who are not officers of the Academy, giving his general and professional qualifications. Before the name of the applicant is even submitted to the Executive Board, he must have unanimous endorsement by every member in his District.

I have answered at some length two questions. They were, what is the relationship between the Academy and the American Board of Pediatrics; and second, relating to the wisdom of using Board certification as the general though not exclusive criterion for applicants for Academy membership. I will now discuss the question, why do so many well qualified pediatricians fail in the Board Examinations? The failure rate is now about 20%. This is lower, not higher than in previous years, and considerably less than some of the other Boards. This decrease has been brought about by more careful survey of those hospitals which are approved for pediatric residency training.

It is a fact that the majority of patients seen by pediatricians are well, and the information the parents seek is in the field of growth and development. So important is knowledge in this area regarded by the Board of Pediatrics, that it represents one-fourth of the oral examination. Many who fail do so because they do not know this subject. A statement of the Board of Pediatrics on this point was recently published* and all, whether applicants or members, should read it.

Why must applicants wait so long before they are allowed to take the examination? The Board of Pediatrics explains this was due to the great number of applications that were made by veterans immediately upon their return from the war. They were set up to take care of the average number (approximately 200), when a great many more than the average applied. They are now so arranged that nearly four hundred a year can take the examinations. This is made possible by extra work given by the examiners. You should know that these Board members receive nothing but traveling expense for their work, and many give freely 20 or more days annually to this task, which is a lot to ask of anyone. It is unnecessary to state that the number of those eligible to take the examinations and held up because there is no one to give them has been very materially reduced, and will soon be negligible.

It is also true that the list of candidates to take the Board is misleading. Prospective candidates are urged to submit their application a year in advance of eligibility. That swells the candidate list with those who could not take it under any circumstances for a year.

The concluding question has to do with the Board applicant who has failed his examination and is told that he must stop practice and take a year's pediatric residency before he is eligible to take the examination again. Last year the American Board of Pediatrics adopted the following policy: Applicants who fail the first examination become eligible for a second after a year has elapsed. After a second failure, a third examination is permitted in one year. Before becoming eligible for a fourth examination, however, the candidate must serve another year of residency training.

This is a far more liberal policy than obtains in many other Boards, and is about the utmost that can be asked.

The summary of the matter is that the Academy receives invaluable help from the American Board of Pediatrics. Our numbers are growing annually, and it is the intention of the Executive Board to assure the quality of those that join.

PAUL W. BEAVEN, M.D., *President*

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* PEDIATRICS 7:430 (March) 1951.

REPORT OF THE EXECUTIVE BOARD MEETING

Chicago—October 13-15, 1950

The meeting of the Executive Board of the American Academy of Pediatrics was held at the Palmer House, Chicago. The first session was called to order at 10 a.m., Dr. Edward B. Shaw, President, presiding.

The following were present: Drs. Edward B. Shaw, Paul W. Beaven, Clifford G. Grulee, Edgar E. Martmer, Marshall C. Pease, Einor H. Christopherson, Harry Bakwin, Philip S. Barba, Crawford Bost, Federico Gomez, Roger L. J. Kennedy, Arthur H. London, Jr., Thomas J. McElhenney, Oliver L. Stringfield and Edward A. Wishropp.

The following Alternate District Chairmen were present as guests and observers: Drs. Harrold A. Murray, Preston A. McLendon and Benjamin Hoyer.

The following applicants for fellowship were approved:

District I

Dr. Reginald A. Allen, Providence, R. I.
Dr. Marshall Bradford Kreidberg, Boston
Dr. Marguerite Mary Neylan, Boston
Dr. Walter Pick, Fitchburg, Mass.
Dr. William M. Schmidt, Needham, Mass.

District II

Dr. Arthur Forrest Anderson, New York City
Dr. Seymour S. Bluestone, Brooklyn
Dr. Selma Buchbinder, Rockville Centre, L. I.
Dr. Forris Ensor Chick, New York City
Dr. Felix Feldman, Neponsit, L. I.
Dr. Harold M. Goldstein, New York City
Dr. Steven Ellis Koweity, Glenwild, N. Y.
Dr. Dominick Mele, Schenectady, N. Y.
Dr. Thomas Edward Mosher, Ithaca, N. Y.
Dr. Nicholas E. Pingitore, New York City
Dr. Bernard Redner, Brooklyn
Dr. Norman Stillman, Hempstead, L. I.
Dr. Virginia Travell Weeks, Brooklyn
Dr. Stanley S. Zipser, New York City
Dr. Benjamin Zohn, Brooklyn

District III

Dr. Eugene Paul Caro, Linden, N. J.
Dr. Bernard I. Michaels, Pittsburgh
Dr. Forrest George Moyer, Allentown, Pa.
Dr. E'Tienne Raymond O'Brian, Plainfield, N. J.
Dr. Louis Arthur Perillo, Perth Amboy, N. J.
Dr. Frank W. Shaffer, Norristown, Pa.
Dr. Robert Traill Shipman, Jersey City, N. J.
It was voted that Dr. Norman K. Nixon, Philadelphia, be reinstated.

District IV

Dr. Ralph E. Baxter, Miami Shores, Fla.
Dr. Sidney William Coren, Norfolk, Va.
Dr. Harold Y. Finck, Washington, D. C.
Dr. Charles H. Gay, Charlotte, N. C.
Dr. Albert Warren Kitts, Salisbury, Md.
Dr. Elizabeth Sarah Linson, Hagerstown, Md.
Dr. Audrey J. McDonald, Rockville, Md.

Dr. Morris I. Michael, Washington, D. C.
Dr. William Irvin Neikirk, Norfolk, Va.
Dr. George Saxon Palmer, Tallahassee, Fla.
Dr. Charles T. Rumble, Macon, Ga.
Dr. Richard Larcombe Schley, Jr., Savannah
Dr. Ralph Sophian Stiller, Alexandria, Va.

District V

Dr. Irving Frederick Burton, Detroit
Dr. Alexander S. Fisher, East Liverpool, Ohio
Dr. Nathan Irwin Handelman, Louisville
Dr. Robert M. Heavenrich, Saginaw, Mich.
Dr. S. Sprigg Jacob, East Lansing, Mich.
Dr. Alexander J. Kahn, Indianapolis
Dr. Joseph A. Little, Louisville
Dr. Roland E. Miller, Lafayette, Ind.
Dr. Philip I. Panitz, Akron, Ohio
Dr. Charles Frank Payton, Royal Oak, Mich.

District VI

Dr. John M. Adams, Minneapolis
Dr. Hans C. S. Aron, Chicago
Dr. Leonard L. Braun, Chicago
Dr. Alvin Elliott Buckwold, Saskatoon, Saskatchewan, Canada
Dr. Victor Jacob Cordes, Wauwatosa, Wis.
Dr. Josephine Earlywine, Wilmette, Ill.
Dr. Harold X. Gerber, Chicago
Dr. Seymour Klein, Chicago
Dr. Frederick L. Phillips, Chicago
Dr. Robert D. Semsch, Minneapolis
Dr. Eugene L. Slotkowski, Chicago

District VII

Dr. Myron John Adams, Kingsport, Tenn.
Dr. Bedford Hudson Berrey, Harlingen, Tex.
Dr. Jack R. Frank, Crowley, La.
Dr. Norman Merlin Hankin, St. Louis
Dr. Lacy George Horn, Jr., Vicksburg
Dr. Charles Hobart Housholder, Memphis
Dr. Hilbert P. Jubelt, Manhattan, Kan.
Dr. Donald Hemphill McDonald, Abilene, Tex.
Dr. John C. Martz, St. Louis
Dr. Charles Kermitt Pitt, Decatur, Ala.
Dr. Donald J. Silberman, Birmingham, Ala.
Dr. Daniel F. Sullivan, Mobile, Ala.
Dr. John A. Welty, Harlingen, Tex.
Dr. Otis Wayne Yeager, Birmingham, Ala.

District VIII

Dr. Winona G. Campbell, Denver
Dr. Max Kaplan, Denver
Dr. Lula O. Lubchenco, Denver
Dr. John Patrick McDermott, Seattle
Dr. Percy Minden, North Hollywood, Calif.
Dr. Edwin Albert Moody, Bend, Ore.
Dr. Mary B. Olney, San Francisco
Dr. Karl W. Schmidt, Burbank, Calif.
Dr. George E. Weick, Boise, Ida.

District IX

Dr. Augusto Gomes de Mattos, Sao Paulo, Brasil
Dr. Manuel F. Cornejo Bustamante, Lima
Dr. Guillermo Llosa Ricketts, Lima
Dr. Oscar Anibal Abeya, Buenos Aires
Dr. Marcelo F. Canevari, Buenos Aires
Dr. Augusto Alberto Giussani, Buenos Aires
Dr. Matias Ramos Mejia, Buenos Aires
Dr. Cesar Sallares Dillon, Buenos Aires
Dr. Hector Jose Vasquez, Buenos Aires
Dr. Mario Waissmann, Buenos Aires

It was voted that application for fellowship in the Academy will be circularized only when it is in the Central office 6 weeks before the meeting of the Executive Board.

The following requests for Emeritus Fellowship were granted:

Dr. Chester R. Brown, Arlington, N. J.
Dr. Alfredo Casaubon, Buenos Aires
Dr. Clain Fanning Gelston, San Francisco
Dr. Carl H. Laws, Brooklyn
Dr. Samuel I. Lebeau, Pittsburgh (Deceased after being granted Emeritus Fellowship)
Dr. Erling S. Platou, Minneapolis
Dr. Frederick C. Rodda, Minneapolis
Dr. Victor E. Stork, Los Angeles
Dr. Andrew J. Thornton, San Diego
Dr. Alfred A. Walker, Birmingham, Ala.
Dr. Charles A. Wylie, Corona del Mar, Calif.

Resignations were accepted from the following:

Dr. Eugenio Cienfuegos, Santiago, Chile
Dr. George R. Clammer, Hamburg, Pa.
Dr. William M. Happ, Escondido, Calif.
Dr. Luther P. Harsh, Akron, Ohio

Dr. Paul L. Boisvert, Orange, Conn., was granted a leave of absence for one year from July 1, 1950, to June 30, 1951. Dr. Weston M. Kelsey, Winston-Salem, N. C., was granted a leave of absence for one year from July 1, 1950, to June 30, 1951.

Dr. Charles I. Solomon, Hartford, Conn., was dropped from the rolls of the Academy for non-payment of dues.

The Secretary was instructed to write to the proposer of Dr. Robert Edmund Switzer, Denver, Colo., for Associate Fellowship, suggesting that he is not acceptable under the general purposes of Associate Fellowship, that it might be possible later on for Dr. Switzer to come under the Section on Mental Health.

It was voted that any fellow writing in regard to his standing in the Academy while in the Armed Services be informed that the matter is under advisement, and that any action taken will be made retroactive.

Dr. Milo K. Miller was informed that doctors being called back into the Armed Services before they had been able to take their Board examinations would be granted a leave of absence to take their examinations, according to information received from a representative of the Surgeon General.

It was voted to accept the following report of the President:

During the past year many important matters affecting our organization have been the concern of the President and of the Executive Board. Shortly after the Annual Meeting in San Francisco, the report of the Committee on Reorganization was submitted to the fellowship for its approval by means of a mail vote. At the same time, the opinions of the fellowship regarding the implementation of this report were solicited. The results of this vote were overwhelmingly in favor of the adoption

of the reorganization report and many valuable comments were submitted which have been extremely useful to your officers for their guidance in their task.

Following this mandate, steps were taken for the formulation of necessary changes in the Constitution and By-Laws which have gradually been assembled under the direction of Dr. Joseph S. Wall, Chairman of the Committee on Legislation. A minor change in the Constitution has already been submitted to the fellows, prior to final presentation for confirmation at the Annual Meeting, and changes in the By-Laws will be presented which will conform to the general objectives of the recommendations of the Committee on Reorganization.

Following this action, the chief concern of your officers was the selection of an Executive Secretary to succeed Dr. Grulee on his retirement in July 1951. A committee consisting of Drs. Kennedy (Chairman), Barba and Bost was appointed to consider candidates for this position. Effort was made to consult the fellowship in every possible way in the selection of this appointee. The final responsibility for this appointment rests in the Executive Board, and the members have already been notified of the selection of Dr. Einor H. Christopherson for the position of Executive Secretary to succeed Dr. Grulee.

In the opinion of your officers, Dr. Christopherson is eminently qualified to serve in this difficult assignment. In the interval between the Annual Meeting and next July, Dr. Christopherson will work closely with Dr. Grulee so that when he finally succeeds to the position of Executive Secretary, he will have had the benefit of this period of indoctrination. I am assured that the members will approve of this appointment and the method by which it has been effected and will give to Dr. Christopherson the friendly assistance and cordial support without which tenure of this position would be an impossibility.

The past year has witnessed the final cessation of activity in the Committee for the Improvement of Child Health of several of those who served us so long and so faithfully. The resignation of Mr. Eldridge Hiller was followed by that of Mrs. Elizabeth Lammie, Dr. John P. Hubbard and Dr. Glidden Brooks. We are happy to note, but without surprise, that all of these have gone on to positions of great usefulness and importance elsewhere and to each of them goes our gratitude for the completion of the most ambitious task which the Academy has yet attempted. All of these, together with the members of the Committee for the Improvement of Child Health, have contributed far beyond the call of duty and the Academy will forever remain indebted to them. Fortunately, the activities of the Committee for the Improvement of Child Health have been continued under the direction of Dr. Warren R. Sisson. The work of this committee has been to carry forward the final interpretive report of the Study and to further the action regarding medical education, including conferences of educators and other interested persons, already initiated by Dr. Hubbard, Dr. Brooks and the other committee members. It is contemplated that the ICH Committee will be terminated with the Annual Meeting but will have by then made important contributions to medical education in pediatrics and to the implementation of the study to child welfare in America. The work of this Committee will not cease but will be fulfilled by various committees delegated by the Executive Board and the Executive Secretary.

Under the reorganization plan, it is contemplated that all activities of the Academy shall stem from centralized authority with an Executive Secretary who is responsible to the Board which, in turn, is directly responsible to the fellowship. All activities of the Academy are to be carried on by individuals and committees under completely centralized direction. During the past few months, Dr. Paul W. Beaven, the President-Elect, who will have the greatest responsibility for the appointment of new committees and liaison officers, has made an earnest effort to select chairmen and members of committees for final ratification by the Executive Board which will truly represent the fellowship and will provide a wide distribution of these activities amongst men who are willing to serve faithfully in these positions.

The objective of the President and the Officers of the Academy during the past year has been to relegate authority for every activity of the organization to the fellows. The Academy exists only as a democratic organization which seeks to express the wishes of its fellows. It is my sincere wish that in the future the keen and critical advice of the fellows will serve to guide the officers with respect to every activity, for their final authority can only be effective if it is served by the deep sense of responsibility of every fellow.

I give my cordial greetings to all on the occasion of our nineteenth Annual Meeting.

Respectfully submitted,
EDWARD B. SHAW, *President*

The Secretary's report was accepted as follows:

In making my last annual meeting report to the Academy as its Executive Officer, I wish first to thank you all for the cooperation which I have received almost without exception for the 20 years I have been in office. I have realized for the past two years that without the assistance of the Assistant Secretary and the Office Manager, my work would have been almost hopeless. The work of the Academy has grown enormously and very, very few of its members realize this unless they have been in the office and have seen the inside workings there. The meetings have become more and more complicated so that one is hard put to it to keep track of all the different activities that go on.

We are repeatedly meeting with objections to the amount of the annual dues, from a minority of the members. Two things have very definitely influenced this situation; one is that when we changed from a journal which was not under our control to one which was, it was found necessary to double the amount of the year's contribution demanded from each member for the purpose of keeping this journal alive and getting it started. We had hoped and promised that the contribution would be reduced but up to the present time, it has not been possible. There are many factors involved in this and not the least of them is the matter of taxes with increased cost of materials.

The second is the fact that the dollar is not worth 100 cents in the sense that it was previously but is worth but 59¢ and is likely to be worth less in the not distant future. In calculating the amount of dues one pays, one must take into consideration this fact. The cost of all material and all office help and even means of communication has measurably increased in the last few years. We must, in my opinion, continue with the present dues and even increase them if we are to remain a society with a purpose and not become just another society which holds meetings. The intricacies of the work in the Academy are such that we must employ the best of help in order to carry the work out successfully. When I tell you that try as hard as we may, it is impossible to get out the membership list before the 1st of March, you will wonder what we are doing, but it requires almost all the office force many hours a day for weeks to get this into proper shape and, at the same time, we must carry on the general business of the Academy. When I say all these things, I do not mean to say that there is not a better way to do things than the way we are doing them. There may be, but, none of us is perfect and it is possible that many things can be changed to advantage. However, such changes must come slowly or the result will be chaos.

The Executive Board, during my 20 years, has been a group of the most earnest men with whom I have ever come in contact. They have, without exception, and I *mean* without exception, devoted their time and energies to the good of pediatrics in this country. No one who has sat in on meetings of the Executive Board will, in any way, question this statement. It has been a great privilege to have had this contact.

With this meeting, there will come a definite change in the activities of the Academy. More and more stress will be placed on the various committees and their activities. This, in my opinion, is as it should be. It will broaden the base of the Academy and bring into it the interests of more and more of the fellows.

There has been a gradual but sure cementing of friendship and appreciation between the fellows of District IX and the other fellows of the Academy. We are all proud of the progress which we have made in this assimilation and it is to be hoped that as the years go on the amalgamation will be more complete.

As you all know, I shall give up my executive position on July 1, 1951. My feelings in doing this are mixed. I shall miss the intimate contact with many of my friends upon whom I have depended, nor have these all been among the fellows of the Academy. Many of the friends whom I shall miss, who have been so interested in the activities of the Academy, are connected with commercial firms. To them, too, I wish to offer my heartfelt thanks.

However, I realize that my generation in pediatrics has run its course and that I am no longer capable of expending the effort which is necessary for the proper progress of this organization. I shall never lose interest in it, as you may well know, and, when called upon, will be glad to do my bit. However, I feel sure that the Academy will be in good hands with my successor, Dr. Christopherson, in control. I bespeak from you the same kind of cooperation and kindness for him that you have given me.

It is now my unfortunate duty to present the names of those who have died since my last report:

Dr. Samuel Ash, Newark, N.J.

Dr. Benjamin Bashinski, Macon, Ga.

Dr. Arthur H. Gray, Seattle

Dr. A. B. Grossman, Cleveland (Emeritus Member)

Dr. Samuel I. Lebeau, Pittsburgh
Dr. W. Roger Moore, St. Joseph, Mo.
Dr. L. Howard Smith, Portland, Ore.
Dr. Lewis K. Sweet, Washington, D.C.
Dr. Henry Washeim, Jr., Utica, N.Y. (Emeritus Member)
Dr. Dwight A. Weir, Mansfield, Ohio

(Editor's Note: In addition to the above, the following deaths were reported by Dr. Grulee at the Business Meeting on Oct. 18.)

Dr. Stanley Brady, New York City
Dr. Fessenden L. Day, South Chatham, N.H. (Emeritus Member)
Dr. Roy M. Greenthal, Milwaukee
Dr. Lawrence V. Hanlon, Brooklyn, N.Y.
Dr. Katherine M. Mayer, Chicago
Dr. Hugh Leslie Moore, Dallas
Dr. Robert E. Ramsay, Pasadena, Calif. (Emeritus Member)
Dr. W. B. Reading, Galveston, Texas
Dr. E. Warren Ripley, Montclair, N.J.
Dr. João Rodrigues de Souza, Brazil
Dr. John A. Toomey, Cleveland

Respectfully submitted,
CLIFFORD G. GRULEE, *Secretary*

The Treasurer's report and the simplified Treasurer's report were accepted as follows:

CONSOLIDATED STATEMENT, ASSETS AND LIABILITIES, JULY 1, 1950

Assets

Bonds		
USA Savings Bonds, 2½-Series G—Due June 1, 1953	$26,200.00	
Defense Bonds, Series F—Due Oct. 1, 1953	2,217.50	
Defense Bonds, Series F—Due Jan. 1, 1954	4,435.00	
Cash on Deposit—Northern Trust Co.	77.10	
Bank Deposits—Savings Accounts		
State Bank & Trust Company	31,876.41	
First National Bank & Trust Company	23,673.26	
Bank Deposits—Checking Account		
State Bank & Trust Company	56,209.07	
Charles C Thomas PEDIATRICS Account	4,070.85	
Total Assets		$148,759.19

Liabilities

Tumor Registry Funds	9,978.81	
American Cancer Society	$5,978.81	
Loyal League Philanthropies	4,000.00	
ICH Committee Funds	2,228.17	
Latin-American Scholarship Fund	2,000.00	
Initiation Fees on Deposit	2,450.00	
Credit Balance Members Accounts	440.81	
Reserve for Unpaid Bills	2,026.12	
Prepaid Registration Fees and Exhibits (Chicago Meeting)	18,160.00	
Total Liabilities		37,283.91

Surplus

Academy Account	91,788.88	
PEDIATRICS Account	19,686.40	
Total Surplus		$111,475.28
		$148,759.19

JULY 1, 1949, TO JUNE 30, 1950

Subscriptions PEDIATRICS	$25,450.00	
Dues	70,486.92	
Initiation Fees	7,350.00	
Interest Earned	929.10	
Grants for Tumor Registry	14,000.00	
Grants for ICH Committee	8,000.00	
Grant for Latin-American Scholarship	2,000.00	
Pamphlets	2,354.97	
Certificates	4.00	
Special Account PEDIATRICS	11,736.61	
Interest Earned on Special Account	206.54	
Repayment of Loan (Connecticut)	1,000.00	
Sale of Equipment (ICH Committee)	995.00	
Annual Meeting San Francisco, Calif.	25,503.50	
Areal Meeting Philadelphia, Pa.	14,064.50	
Prepaid Fees Chicago 1950 Meeting	18,160.00	
Total Receipts		$202,241.14

EXPENDITURES

JULY 1, 1949, TO JUNE 30, 1950

Subscriptions PEDIATRICS	$25,450.00	
Evanston Office	47,715.67	
Executive Board	13,399.21	
ICH Committee	44,340.26	
Tumor Registry	4,046.19	
Other Committees	2,367.21	
Districts and States	363.67	
Pamphlets	1,100.25	
Meetings	39,318.06	
Contribution—Midcentury White House Conference on Children and Youth	100.00	
Total Expenditures		$178,200.52

The reserve fund for the central office should reach and maintain an amount of not less than $95,000 to cover a year's expenses; that for PEDIATRICS should be $70,000. These sums represent approximately the operation for one year.

It was voted to authorize the Secretary-Treasurer to sign a lease for the space occupied by the central office at the present time and, perhaps, for two additional rooms.

It was voted to adopt the following as financial policy of the Academy:

1. No officer, fellow or employee of the Academy shall incur any indebtedness in the name of the Academy in excess of such amounts as the Executive Board authorizes.

2. No officer, fellow or employee of the Academy shall solicit funds, donations or gifts in the name of the Academy unless he or they are specifically authorized by action of the Executive Board.

3. All officers, fellows and employees shall submit bills for expenses within 90 days after the expense is incurred.

4. Any surplus remaining in a budget after the payment of all bills incurred during the budget period shall be returned to the Treasurer for placement in the Reserve Funds of the Academy.

5. The Reserve Funds of the Academy shall be maintained at not less than $95,000 insofar as possible so as to provide for financial emergencies.

6. The Reserve Fund for PEDIATRICS shall be increased to $70,000 as rapidly as possible out of profits accruing from its publication.

7. All Academy funds shall be maintained in Academy bank accounts as authorized by the Executive Board. Bonds and other securities purchased under authorization of the Executive Board shall be maintained in such manner as the Executive Board shall authorize.

It was voted that the Budget Committee be changed to that of Budget and Finance Committee.

It was voted that Dr. Grulee be appointed Treasurer upon reorganization of the Academy.

It was voted that the Executive Secretary and Business Manager each be authorized to sign Academy checks.

The Historian gave a verbal report to the Executive Board, and it was voted to submit the history to the Publications Committee and advise them to report on the possibilities of publishing the history.

It was voted to accept the following District reports:

Report of District I

Dr. Colin C. Stewart, State Chairman for New Hampshire, states that their study report is shaping up. He hopes to have it finished in the near future.

Dr. Robert M. Lord, State Chairman for Rhode Island, reports his survey of child health services has been completed and distributed to all fellows, hospitals and charitable organizations in his state. Some of the fellows are working in cooperation with the Rhode Island Committee on Children and Youth for the Midcentury White House Conference.

Dr. Alton Goldbloom, Chairman for the Province of Quebec, reports there have been no Academy activities in his Province. He will discuss his problems at the State Chairmen's Meeting.

For the past 7 years, it has been my privilege to serve on the Executive Board, first, as Chairman of Region I, and, latterly, as Chairman of District I. The wholehearted assistance and guidance of the State Chairmen and many other fellows of the District has made my tenure of office a pleasant and most interesting experience. To them, I wish to express my gratitude and hope they will give my successor the same loyalty and cooperation.

There have been submitted, from this District, 6 names for Fellowship in the Academy.

Respectfully submitted,
Oliver L. Stringfield, *Chairman*

Report of District II

Progress is being made in the organization of all 3 sections in District II. A copy of the Constitution and By-laws copied after that of Massachusetts, but modified by the meeting in Philadelphia to include articles of dues, is being mailed this month. The election of officers will take place later.

During the past year there has been no unusual development in Dr. Givan's region. Child health problems have been dealt with in the usual manner, and fairly effectively. The Child Health Committee held a meeting this winter in Brooklyn in cooperation with the Department of Health of the City on the premature set-up. Hospitals designated for the acceptance of prematures are well staffed and the smaller private hospitals are sending their small prematures to these centers.

Academy members are taking an active part in the New York State Child Welfare Committee. A nominating committee for this area has been appointed, and election of officers will be consummated in the near future. A Constitution and By-laws are being sent to each member of the Academy in this District.

Respectfully submitted,
Harry Bakwin, *Chairman*

Report of District III

There have been no new activities in the district but all 3 state chapters are continuing their usual active interest in pediatric affairs.

Several of the members are active in the various state committees for the White House Conference.

Delaware and Pennsylvania still have their State Reports on the Study to get out. The Pennsylvania report will be different from any report I have seen. We feel that it will be of use to all states and the method of analysis will be readily adapted to other results.

Respectfully submitted,
Philip S. Barba, *Chairman*

Report of District IV

There have been 22 applications for fellowship received in District IV since the last annual meeting. The District Chairman has attended each Executive Board meeting held during the past year. The following is the report from the State Chairmen:

Maryland (Dr. Paul A. Harper, State Chairman): The Report of Child Health Services in Maryland has just been published. This was reviewed by the fellowship at its annual meeting and each individual recommendation was unanimously approved. There are at present 47 fellows of the Maryland Chapter. Since the last Annual Meeting, there have been 10 applications for fellowship.

District of Columbia (Dr. Hugh J. Davis, State Chairman): There have been 2 applications for membership since the last Annual Meeting. There has been one meeting of the entire fellowship and the business of the Academy has been conducted in the interim by an Executive Committee of seven fellows.

The District of Columbia Chapter again calls the attention of the Executive Board to the matter of fellows of the Academy living in the Metropolitan area of the District of Columbia but actual residents of adjoining states. These fellows' hospital work and chief medical interests are in Washington, D.C. It is desirable that they become fellows of the District of Columbia Chapter in order to increase their interests in Academy affairs. It respectfully requests the Executive Board to consider this matter of affiliating these fellows.

Virginia (Dr. Emily P. Gardner, State Chairman): There are 3 new fellows since the last Annual Meeting.

West Virginia (Dr. Russell C. Bond, State Chairman): There has been one application for fellowship.

North Carolina (Dr. Charles R. Bugg, State Chairman): There have been 3 applications for fellowship during the past year. The chief project of the North Carolina Chapter has been forwarding the Premature Program in the State. During the year July 1949 to July 1950, 584 prematures were admitted to the official centers with an over-all mortality of 14.6%. Fellows of the Academy are represented on the Advisory Committee of the State Board of Health and the North Carolina Branch of the National Foundation for Infantile Paralysis. The annual meeting of the North Carolina Pediatric Society was held on Sept. 9.

South Carolina (Dr. William Weston, Jr., State Chairman): The joint meeting of pediatricians and orthopedists was held in May and, at this time, it was agreed that pediatricians see each new case in the orthopedic clinics of the State as a consultant. This marks the beginning of cooperation between the orthopedists and pediatricians in the clinics. There is close cooperation between the pediatric group and the Director of Maternal and Child Health and the Crippled Children's Program. The annual meeting of the South Carolina pediatricians will be held Sept. 27.

Georgia (Dr. William W. Anderson, State Chairman): There have been 2 applications for fellowship. The Georgia Chapter of the Academy met jointly with the Georgia Pediatric Society in May 1950. There are 2 teaching wards for premature care in Georgia—one at Atlanta and the other at Augusta. As a result of this activity, the death rate on prematures is declining. The major activity of the members of Georgia has been directed toward accident prevention. They are cooperating with other organizations in publicizing methods, especially safety devices in the home.

Florida (Dr. James R. Boulware, Jr., State Chairman): There have been 2 applications for fellowship in the past year. A demonstration unit on premature care has been set up in Dade County. It is planned that nurses will rotate through this unit in order to learn more about the care of prematures. A symposium was held in Orlando on premature and newborn with 90 physicians attending. There is close cooperation with the Crippled Children's Commission and with the Mental Hygiene Program of the State. There are many younger pediatricians in Florida who have not taken their Boards and the State Chairman is encouraging them to do so in order that they may become fellows of the Academy.

Puerto Rico (Dr. J. Roberto Aguayo, State Chairman): The Puerto Rico group has requested the Academy to start a Child Health Study on the island.

Respectfully submitted,
Arthur H. London, Jr., *Chairman*

Report of District V

Following are the reports by states:

Ontario: Little activity has taken place except that committees have been selected for the National Meeting of the Academy to be held in Toronto, and preliminary arrangements for this meeting have been made.

Ohio: The chapter of the AAP met in Cleveland in the spring and voted to organize an Ohio Chapter of the Academy. This chapter adopted a constitution which provided for an annual meeting to be held in conjunction with the Ohio State Medical Society. A nominating committee was elected and will meet in Cincinnati next spring. The committee of the Ohio White House Conference Group and the members are very active in this conference.

Kentucky: A State pediatric society has been organized to include not only members of the Academy but any physician who is interested in pediatrics. The first meeting was held April 21, 1950, with a good attendance. There has also been organized a Louisville Pediatric Society which holds monthly meetings, for the same purpose. These chapters have arranged a postgraduate course in pediatrics in conjunction with the State Board of Health, with a one day course in pediatrics to be held annually for 4 consecutive weeks. June 1, 1950, the Academy Chapter held its biennial meeting and a nominating committee for the new State Chairman was appointed to mail ballots to each member.

Indiana: The next meeting of the Chapter will be held in conjunction with the State Medical Society at French Lick late in September. Over 2,500 copies of the Child Health Study for Indiana have been distributed to individuals and organizations which were interested.

Michigan: A meeting of the Chapter was held in Lansing Sept. 14 and 15 in joint session with the Michigan Youth Commission at the Midcentury Meeting of the White House Conference and was well attended. This 2 day program dealt mainly with the various social and welfare agencies of the state and their various activities. The Academy has directed its efforts to cementing a better relationship with the state medical society as well as other professional and lay groups and with considerable success. Fellows have been active on the committees for (1) Iodized Salt; (2) Rheumatic Fever Control; (3) Child Welfare (made up entirely of Academy members); (4) Preventive Medicine of the State Society.

A fellow of the Academy holds the office of Executive Secretary in both the Rheumatic Fever Control Committee and the Michigan Heart Association. Another is chairman of the Liaison Committee between the MSMS and the Bureau of Maternal and Child Health Group. The State Chapter is also represented on the Medical Advisory Board of the Michigan Crippled Children's Commission and on the Advisory Board for the Governor's Youth Conference Commission. This last named Board establishes the minimum fees for governmental agencies and the Blue Cross Insurance Plan, which is operated in the State by the MSMS.

Contact with the American Legion has been disappointing but that with the State Tuberculosis Society and the Michigan Crippled Children's Commission has been most satisfactory. Our public relations with various groups of citizens has brought our influence and training to a much higher level than anything heretofore experienced in the State.

The Academy Chapter met in Detroit Sept. 21 at the time of the annual meeting of the MSMS. Election of officers took place and 2 members-at-large were elected to sit on the executive committee. Dues were established at $5 per annum but such dues are not to be collected from newly elected members of the Academy for the first 3 years. At this meeting there was a detailed report given by Dr. Frank Van Schoick, State Chairman, on the meeting with the Governor's Youth Conference and White House Conference Midcentury Meeting which took place in Lansing, Sept. 15.

There will be at least one other meeting of the Chapter, probably in conjunction with the Detroit Pediatric Society early in 1951 and another in the western part of the state. Problems which come up in the State Medical Society Section on Pediatrics are referred to the Academy meetings almost universally, for action. The Association and co-operation of these 2 groups is practically concomitant.

Twenty candidates have made application for Fellowship from District V since the last Annual Meeting.

Respectfully submitted,
Edward A. Wishropp, *Chairman*

Report of District VI

Since the last meeting, applications for Fellowship in the Academy have been completed by 11 individuals.

Reports have been received from 5 District and Provincial Chairmen.

Illinois (John L. Reichert, State Chairman): The activities of the Academy since my report to you on Feb. 18 have centered on local arrangements for the October meeting. There has been some progress in other projects however:

The publication of the ICH report by the Illinois State Medical Society is expected with any issue. I have reason to doubt that it will be in print before November. The White House Conference asked for our data and a group of consultants has been analyzing it. The results of their analysis will be given to us at a meeting on Sept. 18.

The school health program has made a great deal of progress at the state level during the summer. It is the most ambitious and successful child health movement in Illinois, and I think the Academy should have a voice in it.

The Committee on Fetus and Newborn reports that the regulations as to the conduct of newborn nurseries, as drawn up by the Committee, have been accepted by all the Chicago hospitals. This Committee has done an outstanding job.

We are planning to explore the question of an Illinois Chapter of the Academy. To this end, there will be a meeting of the Illinois members on Sunday, Oct. 15.

Manitoba (Harry Medovy, State Chairman): Pediatric activity in the last year has centered around an expanded program of pediatric teaching under the guidance of Prof. Bruce Chown. Newborn and premature care is receiving special attention and we are endeavouring to follow the lead of the Committee on Newborn Care in raising standards of supervision of infants.

We hope to have a meeting locally after the Academy Meeting to consider a program for accident prevention, a subject which interests all of us here.

A postgraduate course was held at the University in May 1950 and a full day was devoted to pediatric subjects. Prof. Alton Goldbloom of Montreal was the guest speaker.

Saskatchewan (John C. S. Brown, Provincial Chairman): It is most gratifying to be able to report progressive increase in interest being manifested in child health on the part of not only the populace as a whole, but also the administrative forces of the province. It is also comforting to find pediatricians replacing general practitioners in the positions which they should more capably fill when the responsibility is for infants and children.

Crippled Children's Clinics, which were first organized by the provinces under a Dominion grant, have now become a community effort with a public backing. The Easter Seal Campaign, carried through by the school children under the sponsorship of the Rotary Clubs of the provinces, was extremely successful, $52,000 being collected in Saskatoon alone. Two clinics are now organized, one in Regina and one in Saskatoon, both under pediatric supervision.

There is, as well, a concentrated effort on immunization, and traveling immunization clinics have been organized to be of more service to those who find it difficult to attend the central clinics or to go to their doctor's office.

Well Baby Clinics in the schools, organized under the supervision of pediatricians, have been so successful and popular as to require biweekly meets to take care of them. A hearing survey is being conducted in the ninth grade under, I am sorry to say, the supervision of nurses, though every effort was made but failed to have it under proper medical supervision.

The annual tuberculous survey is now going on, this being its third year, and some very excellent work has been done.

There are 7 pediatricians in this province, most of whom are specialists certified by the Royal College of Canada.

South Dakota (Goldie E. Zimmerman, State Chairman): The Governor called several meetings of the Midcentury White House Conference on Children and Youth. I was appointed to represent the Academy and our State.

Our State Study on Child Health and Youth has been of help to this committee.

Requests for copies of the report study are still coming in.

I have attended the committee meeting and feel progress is being made.

Wisconsin (M. G. Peterman, State Chairman): We have organized and supervised the section on pediatrics of the State Medical Society.

We are interested in the organization or establishment of a committee on medical procedures in summer camps. The subject has been discussed with Dr. Gerald M. Cline of Bloomington, Ill., Chairman of the Committee on Cooperation with Non-Medical Groups.

We expect to open a Cerebral Palsy Clinic in Milwaukee on Oct. 1, 1950. There will be a medical director, an occupational therapist, a physiotherapist and clerical help to operate this clinic.

We are making arrangements with the head of the Milwaukee City Health Department to have the majority of school examinations made in the offices of the family physicians immediately after the summer vacation starts in order that corrective or remedial measures may be taken during the summer months and also to relieve the Health Department Staff of the crowding of physical examinations at the beginning of the school year.

Reports from the State Chairmen of Minnesota, Iowa, North Dakota and Nebraska were not received in time to be included in this report.

Respectfully submitted,
ROGER L. J. KENNEDY, *Chairman*

SUPPLEMENTARY REPORT OF DISTRICT VI

Since submitting the report for District VI, additional information has been received as follows:

Minnesota (Roland E. Nutting, State Chairman): During this past spring and summer, the committee formed to implement the findings of our State Child Health Study has had 3 meetings. Our report now should be ready to go to print within the next few weeks.

We have had 2 more applicants for membership in the Academy and one member has been granted an Emeritus membership.

A meeting of the Minnesota members of the Academy was held on Oct. 6 at Bayport. A brief progress report on the Child Health Survey was presented. Dr. Paul Dwan was elected a Fellow at Large to serve a term of 2 years to fill the vacancy of the expired term of Dr. Roger L. J. Kennedy.

Nebraska (J. Harry Murphy, State Chairman): In the past year the Academy fellows have been quite active.

The report of the Survey of Child Health Services has been completed and is in the hands of the publishers. This report was presented before the Nebraska State Medical Association at its May State Meeting at Lincoln. The report was accompanied by a scientific exhibit that included charts, maps and graphs depicting parts of the survey.

A member of the Academy, Dr. Herman Jahr, was recommended and placed on the Nebraska Committee for the White House Conference.

Meetings have been held at which the subject of formula, room design and nursing requirements have been discussed. The problem of liaison with the American Legion has been discussed without results to date.

North Dakota (Ralph E. Dyson, State Chairman): We held a spring meeting in conjunction with the State Medical Meeting in Grand Forks, N.D. Dr. Albert V. Stoesser talked to our society at a luncheon on the use of antihistaminics and presented a paper on allergy to the general assembly in the afternoon.

The fall meeting of the North Dakota State Pediatric Society is to be held Oct. 28 at Minot, N.D. A full day's program is scheduled, the guest speaker being Dr. M. G. Peterman of Milwaukee, Wis. He will talk on convulsive disorders of children.

On Sept. 24, 1950, the Crippled Children's services of the City Welfare Board had a meeting of their medical advisory board. This board includes 3 state pediatricians: Dr. L. G. Pray and Dr. B. J. Mazur of Fargo and Dr. R. E. Dyson of Minot. The main topic of discussion was care of polio patients. An effort is being made to develop a rheumatic fever program in the state.

Dr. R. E. Dyson has been re-elected State Chairman.

Wisconsin (Addendum, M. G. Peterman, State Chairman): Academy members are active on the various committees of the State Medical Society which have to do with pediatric problems.

Dr. H. A. Sincock and Dr. A. B. Schwartz serve on the Advisory Committee on the Care of Crippled Children. Dr. L. M. Simonson and Dr. Amy Hunter serve on the Committee on Maternal and Child Welfare. Dr. Sincock and Dr. Simonson are chairmen of their committees.

REPORT OF DISTRICT VII

Most of the State Reports are about complete. Much of the activity of the fellows has been in this direction. Most of the fellows have been active in every phase of Child Welfare and Medical

Health, mainly in an advisory capacity. Complete State Programs are being carried out by the Maternal and Child Health Departments, and the State Departments of Health. Refresher courses and clinics are being held throughout the entire District. They have been well attended and more general practitioners are attending each year.

Several State Chairmen have repeatedly suggested the need for increased speed in the processing of applicants, pending before the Board of Pediatrics. One Chairman feels that the Academy is losing some very good men because of this delay.

In Arkansas, the most extensive project is carried on by the Crippled Children's Division. There are 125 clinics being held annually by this Division. These children, mainly spastic and deformed children, many times have cerebral conditions. They are seen by the orthopedic surgeons and members of the Academy.

Kansas has elected as its new chairman Dr. Frank L. Menehan.

Louisiana is making an effort to improve the premature program throughout the state. The program is now centered in the charity hospitals, but attempts are being made to improve the transportation of the prematures to these centers. During May, a statewide polio preparedness meeting was held in New Orleans and polio diagnosis and treatment centers have been set up in Baton Rouge and Alexandria, in addition to those already established in New Orleans and Shreveport.

In Mississippi, a resolution against socialized medicine was passed by the Mississippi House of Delegates of the State Medical Society, and also adopted by the Mississippi State Legislature. This was sent to the President of the United States as well as to the Senate.

There has been quite a bit of concern about the White House Conference. The State Committees on Children and Youth have been criticized and there has been concern among the fellows over the central control that may be set up.

A few pertinent comments received recently from fellows within the District follow:

Concern over the efforts of those on the government payrolls to take away what liberties are left comes from every section of District VII. "You cannot present the facts to politicians. Plenty of facts are available to show that socialism is futile. Politicians take perfectly good facts, interpret them to suit themselves, come out with an irrational, but very appealing proposition in the nature of something for nothing. We must watch free enterprise, 'the right to get ahead.' Individual freedom is the heart of the American free enterprise. The power of the purse is the power of authority."

"In about 20 years our tax dollar has shifted from a 75-25% basis, to the exact opposite with the states receiving 25%, Washington receiving 75%."

"Where we are is not as important as where we are headed."

"We have seen the gradual departure from the American system of checks and balances in government, which was the very heart of our Constitution. We must demand that government be our servant and not our master. We must translate the belief in free enterprise into vigorous activity, aggressive defense measures."

Report of District VIII

Attention is called to the addition of some 40 new fellows in this district. This is representative of the widespread increase in pediatricians throughout the west. Many of these new fellows and other young pediatricians are locating in areas not previously so served. Such coverage helps greatly to fill the gaps disclosed by the Survey.

A number of State Chairmen and other members have been participating in the state programs incident to the Midcentury White House Conference.

Dr. Frank H. Douglass, Alternate District Chairman, was one of the several members from this district who attended the Sixth International Congress of Pediatrics at Zurich this past summer.

It is gratifying again to report the widespread interest and participation of Academy members throughout the district in the numerous child health and welfare activities in the several states. Academy leadership is everywhere evident.

It is particularly pleasurable to record 2 events of major interest to this district, first, the fine leadership of Dr. Edward B. Shaw as President of the Academy this year 1950 and secondly, the selection of Dr. Einor H. Christopherson, for many years a leading practicing pediatrician in San Diego, as the new Executive Secretary of the Academy.

Respectfully submitted,
Crawford Bost, *Chairman*

Report of District IX

The following local branches of the Latin American District were visited:

México	Cuba	Bolivia
Guatemala	Perú	Paraguay
Colombia	Brazil	Uruguay

Meetings were conducted with the different groups, in order to prepare programs to be developed during this year. All the local branches are celebrating regular meetings and the Chairmen in these countries are working in the Pediatric Census as part of the program approved at the Executive Board Meeting in Philadelphia in March 1950.

The census will include, in each country, the number of pediatricians, number of children's hospitals, number of official and nonofficial institutions working in any of the pediatric fields, pediatric books and journals published in the country, pediatric programs in schools of medicine, and programs in postgraduate courses, and professors of pediatrics teaching in the faculty or in hospitals.

New local Chairmen and Secretaries were elected in District IX, and new members with the necessary requirements were accepted into the Academy.

At present the fellowship is 270 in the District; only 2 countries, Haiti and Paraguay, are still out of the association. We hope to bring them in, in the near future.

The 4 countries that have the largest number of members are:

Brazil	56
México	42
Cuba	31
Argentina	30

The Third Pan American Congress of Pediatrics will be held in Montevideo, Uruguay, from the 5th to the 8th of December, 1951. Dr. Conrado Pelfort is President of the Organizing Committee.

I expect to visit 5 to 7 additional countries before the end of this year, to collect information for the Academy.

Respectfully submitted,
Federico Gómez Santos, *Chairman*

The Secretary was authorized to cooperate with the District IX Chairman in every way possible in helping the organizing committee of the Third Pan American Congress of Pediatrics to send men from the United States to appear on their program.

The following elections of District and Alternate District Chairmen were certified by the Executive Board:

Dr. Stewart Clifford—District I Chairman
Dr. William J. Orr—Alternate District II Chairman
Dr. Arthur H. London, Jr.—District IV Chairman
Dr. Benjamin Hoyer—Alternate District V Chairman
Dr. Thomas J. McElhenney—District VII Chairman
Dr. Frank H. Douglass—Alternate District VIII

It was the consensus that it is not practical to send out biographic sketches covering candidates for offices.

Regarding fellows living in Virginia and Maryland desiring to be fellows of the District of Columbia chapter, it was voted that the men in these metropolitan areas be allowed to be associated with the District of Columbia as affiliate fellows or associate fellows but that their official voting on Academy matters be done in the state in which they reside. The Executive Board was sympathetic with suggestions made on behalf of the men living in metropolitan areas, but felt it would produce almost insurmountable difficulties in the central office in the matter of national elections and national policy, and would set a precedent which would be followed by so many metropolitan areas or would be demanded by so many metropolitan areas that it would upset the whole set-up of the organization.

The following report of the Committee on Cooperation with Non-Medical Groups was accepted with thanks and commendation:

Report of the Committee on Cooperation with Non-Medical Groups

At the San Francisco meeting, the Committee on Contact Infections, which was responsible for the "Child Health Record from Infancy to Adulthood," was discontinued and the work of this Committee was placed in the hands of the Committee on Cooperation with Non-Medical Groups. In April, Dr. Grulee reported that the Academy had a few booklets left and asked for any changes to be made. At the Central Illinois Pediatric Society Meeting a group of members expressed their desire for the printing of more books and had no suggestions for any changes. Various other members throughout the middle states agreed. Dr. Grulee reported that from July 1, 1948, to June 31, 1949, 2,098 copies at 15 cents per copy were sold. Your Chairman therefore suggested the reprinting of the booklet. The agenda of this Committee's national meeting in Chicago, Oct. 17, will include this item of special ideas for reprinting. The Committee now have copies for study before the meeting.

Since no national Committee meeting has been held, the agenda also includes reprinting and changes in the "Standard Health Examination Record," a card especially used for camps. Until this is done, it has been suggested by Dr. William R. Phillips, Elmira, N.Y., that each pediatrician attach a note to other camp cards stating: "The American Academy of Pediatrics has prepared a form for use in camp health records. It is inferior to none and superior to most forms. As this child's physician, may we request that you consider adopting this standard form."

This Committee has had no personal contact with the P.T.A. during the last year. Dr. Overall's report in Pediatrics (March 1950) comments on the cordial relationship we established with this organization last year through a personal visit with their national office in Chicago.

This Committee is glad to report that much work has been done regarding a nation-wide study of various state health laws governing recreational camps. All 48 state health departments and directors were sent a questionnaire. One hundred per cent answers were received. Also, letters were sent to National Offices of the American Camping Association, P.T.A., Boy Scouts of America, Camp Fire Girls and Girl Scouts of America. We are indebted to all these offices for excellent cooperation. This fact-finding material has been voluminous, but at present has been summarized to present to the national committee meeting on Oct. 17, 4 P.M., at the Palmer House. At that time, a National Committee should be appointed to carry on with this work, for only a few states have any such kind of sanitation laws and it is hoped that the Academy can stimulate thoughts and actions along such lines. Your Chairman is indebted to Dr. Hugh McCulloch, Chicago, for his valuable assistance.

Respectfully submitted,
Gerald M. Cline, *Chairman*

The following report of the Committee on Fetus and Newborn was accepted with the Executive Board especially approving the follow-up program which this committee set up:

Report of the Committee on Fetus and Newborn

Your Chairman has served as a member of the Sub-Committee on Fetal Deaths and Infant Mortality of the U.S. National Committee on Vital and Health Statistics. This sub-committee outlined the areas of research and investigation needed to determine what statistics should be collected to best direct medical efforts in reducing pregnancy wastage. The sub-committee's report was accepted by the U.S. National Committee and will undoubtedly be published in the proceedings of the committee.

Your Chairman served as a member of a conference at the Children's Bureau on "Proposals for Study of Survival of Prematurely Born Infants in Hospitals in Relation to Pattern of Newborn Care."

The Academy's "Standards and Recommendations for Hospital Care of Newborn Infants" continues to have wide circulation. As of August 31, 1950, 9,015 copies had been given to members or sold to others.

Your Committee takes great pleasure in congratulating the many state committees on Fetus and Newborn for their active programs to lower neonatal morbidity and mortality in the individual hospitals in their states. The central Committee can outline plans and programs, but it is the fundamental application at the local level that achieves the results. The splendid organization of state and local sub-committees should be preserved and encouraged to continue their most important work.

There are a number of items of unfinished business that we pass on to subsequent committees.

1. Educational films (one for physicians and one for mothers) on the care of the newborn based on the Academy's "Standards and Recommendations for Hospital Care of the Newborn Infant."

2. Finding and promoting the general adoption of a more satisfactory method of ophthalmia neonatorum prophylaxis than the silver nitrate method.

3. Take a positive stand on the question of adoption and promote uniform standards and regulations.

4. Develop a system for the rating of nurseries.

5. Attack the broad problem of pregnancy wastage. Sponsor the standard definitions and classifications as recommended by the Subcommittee of Fetal Death and Infant Mortality.

6. Study the problem of retrolental fibroplasia.

7. Take a stand on BCG immunization at birth for babies threatened with future home exposure to tuberculosis.

8. Attempt to establish a liaison with a comparable committee representing obstetricians for a joint attack on common problems.

Respectfully submitted,
STEWART H. CLIFFORD, *Chairman*

The following report of the Committee on Hospitals and Dispensaries was accepted and approved:

REPORT OF THE COMMITTEE ON HOSPITALS AND DISPENSARIES

Upon acceptance of its report by the Executive Board at the annual meeting of the American Academy of Pediatrics in November 1949, the Committee on Hospitals and Dispensaries was charged with the responsibility of submitting its recommendations on minimal standards of hospital facilities for sick children after consultation with the American Hospital Association and the American Medical Association.

In order to carry out this directive, contact was made through correspondence with the American Hospital Association, American Medical Association, the Protestant Hospital Association, and the American College of Surgeons. As a result of this initial effort the response of the Council on Medical Education and Hospitals of the AMA has been very gratifying as indicated by its Secretary, Dr. Donald G. Anderson, in his reply of Jan. 23, 1950, wherein he states that this is a subject in which the Council is greatly interested. Subsequent cooperation on the part of Dr. Anderson has been exceedingly helpful. At a meeting in Chicago on Feb. 9, 1950, the Council was acquainted with the ultimate aims of this Committee and the question was brought up of the possibility that the American Academy of Pediatrics would be planning to inspect and approve hospitals that have facilities for sick children. Concern was expressed in many quarters, the Council pointed out, because of the multiplication of inspections and approvals that presently confront hospitals. To correct this impression, information was forwarded to the Secretary of the Council under date of March 30, 1950, regarding the meeting of 14 professors of pediatrics which was held under the auspices of the Academy in Kansas City, Mo., during the month of March 1950. At this meeting, the subject was introduced of a study of hospital needs and standards in pediatrics. The feeling was apparent on the part of pediatricians responsible for children's divisions of general hospitals throughout the country that there is a definite need for a nucleus of reasonable and minimal standards to be drawn up by those interested and qualified to be used as a guide in planning and development of future pediatric units. There was not the slightest indication that such a procedure would be looked upon as a potential restriction of any kind to hospitals.

It is the objective of this Committee on Hospitals and Dispensaries to fill this need by compiling a pamphlet containing information as to what would be the least, as well as the optimum, number of internes, residents and nurses necessary to render proper hospital care to children; what is the least number of nurses' aides, feeders, and other pediatric personnel required to carry on proper pediatric care; what appears to be the ideal form of recreation or distraction for the bedridden child who is convalescing, and also for the ambulatory child in the hospital; how much education should be attempted to be carried on; what would be a form that could be developed in regard to the sick child in the hospital; what type of restrictions or privileges in visitors' activities seems most ideal, and a score more of pertinent problems which require consideration and solution.

Since the work of this Committee has been undertaken by its present personnel, one factor has

emerged as a handicap to its progress and that is lack of funds necessary to effect a closer working relationship in the form of meetings with the members of the AMA Council on Medical Education and Hospitals. Such meetings would provide an excellent opportunity for the Council to make such suggestions and supply such information as might seem appropriate to the achievement of the goal of this Committee.

Respectfully submitted,
PETER G. DANIS, *Chairman*

The following report of the Committee on School Health was accepted:

REPORT OF THE COMMITTEE ON SCHOOL HEALTH

From year to year there is a notable increase of interest in the health of the school age child. Physicians, personnel of schools and community health agencies, and others who come in contact with older children are coming to realize that there are both apparent and undiscovered health needs in this age group which have only recently received merited consideration. Throughout the nation in communities and states, and at the national level, thought is being given to ways for meeting the health needs of school age children.

As the health needs of this age group are made known, it is inevitable that schools and communities will initiate health programs for the school age child. It is obvious that these programs should be of high quality and in keeping with current medical thinking. It is appropriate that the American Academy of Pediatrics, an organization of physicians who, by training and experience, are especially qualified in the health problems and the growth and development of children, should endorse a statement of the objectives and practicable scope of health services in a school health program. Fellows of the Academy as well as the Academy as an organization are frequently called upon to participate in planning for school health. General principles of school health, endorsed by the Academy, would be most helpful in such instances.

The following statements are the result of such collaboration, in this instance with the Committee on Child Health of the American Public Health Association. The Academy's Committee on School Health was invited by the Association's committee to participate in preparing statement on school health services which might serve as a guide for organizations or communities concerned with the problem. This undertaking was described in the last report of the Committee on School Health* and in the *American Journal of Public Health*.† No formal statement for official approval of the Academy and the American Public Health Association has been prepared, but the principles which have been agreed upon in the joint committee meetings are submitted herewith for Academy endorsement, to guide the Committee on School Health and other fellows in subsequent conferences of this sort.

Some General Considerations for Health Services for Children of School Age: The child of school age is a member both of his family group and of his community, of which the school is a very important part. Any program of health services for children of school age should emphasize some basic aspects of family, professional and community responsibility. As the child requires year round health services which are available at home as well as at school, it is believed that the important role of all community workers, especially the family physician and dentist, should be recognized in health planning for school children.

Ideally, the family should see to it that each child receives adequate health supervision. The observant parent is the one who should first notice early faint warnings which call for medical and dental advice. It is essential, therefore, to foster a sense of responsibility for good health in the parent, and later in the child, and to encourage a closer relationship between the family, the physician, the dentists and the school.

Ideal care also requires the maximum possible continuity of health supervision. The ideal for quality, and to a great extent for economy, is continuous supervision of each child's physical and mental health, with one continuous record from infancy throughout childhood, as is often provided by the child's own physician.

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* Report of Committee on School Health, PEDIATRICS **5**:525-526 (March) 1950.

† Joint Planning by the American Academy of Pediatrics and the American Public Health Association for the Development of School Health Services, Am. J. Pub. Health, **40**:63 (January) 1950.

The educators are equally responsible for providing a wholesome physical and emotional environment where the child's education will include information of value to the maintenance and improvement of his health.

Many children, however, do not receive such ideal care, and relatively few have such continuous health records. Parental responsibility often needs strengthening, and easy contact between family and physician, dentist and other community resources is often lacking for various reasons. Likewise, the school environment and health teaching frequently have shortcomings.

The child of school age comes in contact with and is influenced by many forces, of which the family, the medical, dental and nursing professions, youth organizations, community health agencies, the health department, and the school are important integral parts. In such a complex situation it is urgent that planning and policy-making with respect to the child's health be a cooperative undertaking. A community health council and a school health council composed of representatives of all interested groups are recommended as effective means to delineate essential functions of each group (family, school personnel, family medical adviser, health department) to an over-all program of health supervision for the school age child, but also to develop ways in which each could contribute to the functions of the others. For example, health education, an essential part of a health program, in the case of the school child is principally done by school personnel. However, members of the medical profession and the health department who are primarily concerned with health services can contribute materially to health education by making the health service procedures a desirable educational experience. Furthermore, the school staff, primarily involved in the educational program, can contribute immeasurably to the health appraisal of the child and through their relationships to the child and his family can play an important part in assuring follow-through to medical treatment when it is indicated. It is only through joint planning that the contributions of each group to the over-all program can be understood and appreciated.

Health Appraisal

The purpose of the health appraisal is to find those children with defects or health problems who need further diagnosis or treatment, or both; and at the same time to provide favorable educational experience for the child and his parents. The mere detection of defects is of little merit except as it results in needed medical and dental care. Corrective action will result most often when the medical examination is done by the child's own physician and, in the case of the elementary school child, when his parents are also present. The school health program should encourage this procedure, should provide health appraisal for those children who do not go to their own physician and should include certain screening tests to be discussed below.

An adequate health appraisal will comprise a history of the child's personal and family life, physical and special screening examinations, discussion of findings with parents and interpretation to school personnel. Such an appraisal will ordinarily require a minimum of 20 minutes per child and time schedules should be planned accordingly.

A. Periodic Health Appraisal by Child's Own Physician

Adequate utilization of the services of the child's own physician should give continuity of supervision in health and illness, combine responsibility for diagnosis and treatment and centralize responsibility for the health problems of the entire family. Examinations which begin as routine health appraisals may lead to complete diagnostic studies and follow-up programs of treatment. The school authorities should foster this procedure by urging parents to take their children to their physician for the periodic health appraisal and also should furnish the physician with a report of the screening examinations described below when they have been done in the school. The school also needs to have certain information, and it is essential to the success of this program that the physician send a report of his findings and recommendations, for the guidance of school personnel. Such reports may ordinarily be limited to a statement of the child's condition and to information and recommendations which concern the school and which require action and understanding by school personnel. Transfer of information back and forth between physician and school can be facilitated by use of simple forms and procedures. One of the main functions of a school physician and nurse is to serve as liaison in this situation.

B. Periodic Health Appraisal Within the School

The periodic examination within the school applies to all children who do not go to their own physician, and should be a careful health appraisal to demonstrate needs rather than the definitive diagnostic procedure necessitated by the child's having a specific complaint. Yet it should be done with such care and detail as to command medical respect and to be a desirable educational experience for child and parent. The limitations of physical examinations which are carried out where there is not easy access to laboratory facilities and specialized personnel should be recognized. Parents of children in elementary grades should be urged to be present at the examination, for it is only thus that an adequate history can be obtained and follow-up care planned. The parent and child will have opportunity to discuss with the physician the nature of health problems, the next steps to be taken and any difficulties that these will present. The teachers should be brought into this work and medical and nursing time must be planned to allow for consultation with the teaching staff. Such a procedure will require more minutes per child, but the full use of the family physician in the examination of his own patients will reduce the number of children to be examined in the schools.

Each school should have regularly available medical service. The responsibilities of the physician providing this service will include advice and consultation to the school staff, health appraisal, and the development of close liaison with other professional personnel in the community.

The frequency of the periodic health appraisal will vary with local circumstances. Routine yearly examinations on every child are seldom profitable; it is a sound principle to do a good job every 4 to 6 years rather than to do a poor job each year. Rather, reliance should be placed on screening programs of a special nature and, particularly, on parent and teacher observation and teacher-nurse conference to detect those conditions which warrant medical consultation.

Health appraisals in the school might well be performed in the following order of priority: (1) pupils referred from a teacher-nurse conference and pupils who have returned to school after prolonged or frequent absence without a medical report; (2) entering pupils; (3) pupils leaving school before the examination at junior high level; and (4) pupils at the junior high school level.

C. Special Screening Technics

The school is a most efficient place for utilizing a variety of nondiagnostic screening technics which should be done on all children of school age. It is our view that every school should utilize regularly planned teacher-nurse conferences to select children needing referral for special, as distinct from routine, health appraisals, and should provide for carefully performed periodic vision tests, audiometric hearing tests, speech tests, body measurements and other screening tests as their values become established. Results of these tests, as well as personal observations of teacher and nurse, should be made available to the examining physician or dentist, and to members of the education staff concerned with the individual child.

D. Follow-Up

The mere detection of the need for medical care is of little value unless it results in obtaining that care, and school health services must, therefore, include planning for follow-up. Everyone who has had any connection with school health work is familiar with the multitude of children whose records year after year show the same defect with no correction.

Successful follow-up to secure correction of defects requires the cooperative effort of physicians, dentists, nurses, medical social workers, teachers and other individuals. The teacher and nurse are the key persons in follow-up. The nurse has the opportunity to visit the home and to overcome the obstacles to securing medical and dental attention. More effective results are obtained if the nursing service is given by nurses qualified in public health. The most efficient type of nursing service will vary with the local situation; in some areas it may be by a public health nurse who includes service to the schools in her district as part of a generalized program. In other areas and particularly in very large schools, it may be a public health nurse working full-time in the school health program. In any case, the nurse, to be effective, should maintain direct contact with the health department and with other community agencies.

The advantage of having the parent present at the periodic examination to discuss the health problems of the child and the treatment of any discovered defects has been mentioned. Physicians should indicate to them those defects which should receive priority in follow-up.

Treatment requires definitive diagnosis as distinguished from a health appraisal or screening examination and should ordinarily be done in a physician's or dentist's office, in a hospital or in a health center environment. As no competent physician will undertake treatment on the basis of another's diagnosis, performance of detailed diagnostic procedures twice, once by the physician examining children in the school, and once by the physician responsible for treatment, creates confusion and inefficiency.

In planning with the parent for follow-through to correction special consideration should be given to the importance of diagnosis and treatment of visual, hearing, and speech defects, because they are definite handicaps to learning. Recent developments in the diagnosis and treatment of hearing and speech defects have opened entirely new possibilities for children with these handicaps. Although very few sections of the country have enough adequately trained personnel or suitable facilities for an up-to-date program in these fields, emphasis on these handicaps should stimulate the further development of such personnel and facilities.

The number of children whose parents cannot provide diagnostic and treatment services for handicaps which interfere with growth and development and educational progress is not known but must be substantial. For these children, programs should be planned in cooperation with a suitable hospital or medical center and with medical leadership. The health services within the school should act as a screening device for children needing referral to such services.

Relation of Health Services to Other Aspects of School Health Program

Effective school health services can be achieved only by coordinating them with other aspects of the school health program to provide a healthful environment and opportunities for learning scientific information which will help maintain and improve each child's health. If one phase of the program is weak or lacking, the others are bound to be affected. The medical, dental and nursing services need the cooperation and full participation of the school administrator, teacher, parent and others. For example, the school administrator plans for adequate time and space, and the teacher helps to prepare the children for physical examinations and interprets the results in relation to the child's daily activities. Likewise, the school administrator and teacher need the cooperation of the medical, dental and nursing services to strengthen and make effective the health teaching program. All school personnel, including those providing medical and nursing services, have a responsibility for maintaining and improving the physical aspects of the school environment as well as the emotional atmosphere. All have a responsibility for interpreting to the community the objectives and the methods of endeavor carried on within the school health program and for effectively coordinating the program with other community activities.

Staff Training

There is urgent need for additional personnel with special training and experience in the field of school health. Consideration to staff conferences and postgraduate courses in physical and emotional growth and development of children and the common health problems of this age period, for school personnel, school physicians and nurses and health department staffs is properly a basic objective in local or state planning for the health improvement of school children. Pediatricians can make a most significant contribution to school health by taking part in the planning and teaching of such educational programs.

Colleges of medicine, dentistry and education and schools of nursing need to be encouraged to give increased attention, in their curricula, to child development and the health needs of the child of school age, and to offer special short courses in these same fields for teachers and health specialists who are engaged in health programs in schools.

This statement of desirable school health practices is not presented as policies which are universally applicable. Conditions differ in communities with respect to available medical facilities and the type of professional services at hand in the community and in the schools. The principles expressed might, however, aid members of the Academy when they are called upon to advise in the planning of school health programs or to participate in the operation of the programs. Endorsement by the Executive Board will also assist the Committee on School Health in future cooperative planning with other organizations.

Due to uncertainty about the fate of the National School Health Services Bill in the 81st Congress

the Committee has not continued further in the preparation of a statement on implementation of the Bill. It now appears that the Bill will not reach the floor of the House for a vote in this Congress. A recommendation by the Academy concerning desirable policies for school health, without reference to the administration of a specific program, appears to be more appropriate at the present time.

Respectfully submitted,
THOMAS E. SHAFFER, *Chairman*

The following report of the Committee on Immunization and Therapeutic Procedures for Acute Infectious Diseases was accepted:

REPORT OF THE COMMITTEE ON IMMUNIZATION AND THERAPEUTIC PROCEDURES FOR ACUTE INFECTIOUS DISEASES

During the past few months considerable work has been done by the Committee on Immunization and Therapeutic Procedures for Acute Infectious Diseases. Last year a great deal of outdated material was eliminated from the most recently published report of the Committee and a number of modifications were made. However, because of unforeseen delays, a completed revision was not recommended during 1949.

Because this committee is differently constituted from that of the previous year, it has been felt by the Chairman that the new members should have an opportunity to express their opinions in respect to last year's alterations. Consequently, the work has been gone over again, and it is found for the most part that the committee members are in general agreement in regard to certain immunization procedures which are sometimes considered controversial.

Our progress has been somewhat slow because, as previously implied, an effort has been made to have the conclusions represent, as nearly as possible, the views of all members of the committee and not just one or two. It is unfortunate that great distances make it impossible to hold committee meetings throughout the year.

To the Chairman, it seems very important to have this year's recommendations published in the form of the "Red Book." Other members of the committee, apparently, are of the same opinion. There seems to be a demand for the Academy's recommendations. Moreover, there are several of the newer antibiotics for inclusion in this year's report.

On a number of occasions, inquiries have been directed to the Academy's Secretary or to the Chairman of this committee in respect to BCG. Several states or communities have wished to promote a program of BCG vaccination and have requested advice or approval from the Academy for such an undertaking. Therefore, it seems advisable to mention here that the Committee on Immunization and Therapeutic Procedures is unanimous in the belief that BCG should not be recommended for general adoption.

The Chairman has received splendid cooperation from all members of the committee, each one of whom has contributed valuable assistance with suggestions, recommendations and criticisms.

It is planned to have a completed draft of the committee's recommendations ready before the Academy sessions in October. If a sufficient number of our committee is in Chicago at that time, a meeting is contemplated for the purpose of giving final approval to our report.

Respectfully submitted,
ARCHIBALD L. HOYNE, *Chairman*

The following report of the Committee on Mental Health, Section on Mental Growth and Development, was accepted:

REPORT OF THE COMMITTEE ON MENTAL HEALTH
(Section on Mental Growth and Development)

Although the eastern members of the Section met informally at the Areal meeting of the Academy in Philadelphia in March 1950, there has been active written communication between members of the Steering Committee and members of the Section. The first meeting of the entire group is planned to coincide with the annual meeting of the Academy in October 1950. In keeping with its purpose, members of the Section will participate in seminar and round table meetings during that meeting, as well as participate in the general program. By vote of members of the Section, it is recommended to the Executive Board that the following members of the Academy be invited to become members of the Section on Mental Growth and Development:

Dr. Alfred S. Schwartz, St. Louis
Dr. Richard Wolf, Cincinnati
Dr. Julius Richmond, Chicago
Dr. Ethel Cermak, Albany, N.Y.
Dr. Harry Bakwin, New York City
Dr. Ruth Bakwin, New York City
Dr. Gustave Weinfeld, Chicago

Another item of importance that has been considered by members of the Section has been an appraisal of the film "Problem Child," which was sponsored by the Academy and paid for by the Pet Milk Company. The Executive Board is probably aware that there have been adverse criticisms of the film from educational bodies such as the Department of Home Economics at Cornell University, among others. Accordingly, a poll was taken of members of the Section to determine their attitudes about the film. Although approximately half the members of the Section were not familiar enough with the film to pass on it critically, the other half were in agreement that the film did not represent a good teaching medium of modern mental hygiene. Some of the Section members had already written to the Research Division of the Pet Milk Company, stating audience reactions. Some of the objections of the people who have seen the film were that it "attempted to cover too much, and therefore confused parents"; another was that the film frightened parents. Also, that some of the scenes were particularly bad in that they represented a snobbish approach to the value of manual labor; others felt that the film was boring, that the frequent repetition of the baby pictures did not make for dramatic teaching.

In view of the adverse criticisms, members of the Section suggest that the Executive Board consider the question of whether the film should be withdrawn from circulation.

The Section has arranged its first luncheon meeting program for Oct. 16, 1950, at which time members of the Academy will have an opportunity of learning the aims of the Section.

Respectfully submitted,
MILTON J. E. SENN, *Chairman*

It was voted to accept as members of the Section on Mental Growth and Development the names mentioned in the report. The question of whether the film "Problem Child" should be withdrawn from circulation was discussed. No definite action was taken.

The following report of the Committee on Latin American Affairs was discussed but no action was taken:

REPORT OF THE COMMITTEE ON LATIN AMERICAN AFFAIRS

So far, this Committee has been able to obtain the money for only one scholarship, for the Latin American countries. This was obtained from M & R Dietetic Laboratories, Inc.

We have revised the scholarship application blank, and hereafter this will be submitted only in English.

All State Chairmen in the Latin American countries have been informed of the above but so far, although we have had several inquiries, we have not received any definite applications.

Respectfully submitted,
CLIFFORD G. GRULEE, *Chairman*

The report of the Committee on Pediatric Awards was presented to the Executive Board. It was not necessary to take any action.

After discussion of Dr. Stokes' letters regarding seminar associates, the Executive Board voted not to make any change in the former policy.

It was voted to accept the following report of the Liaison Committee with the American Medical Association:

REPORT OF LIAISON COMMITTEE WITH AMERICAN MEDICAL ASSOCIATION

There has been no meeting of this committee since December 1949. Correspondence has developed the fact that relations between the two organizations are better than ever before. Dr. Harvey F. Garrison, Liaison Representative to the AMA, has so reported in his report to the Board. Dr. Walter B. Martin, Chairman of the AMA Committee for liaison with the American Academy of Pediatrics, has written me to similar effect. With the present situation in the armed services, there may be new matters of policy to be discussed in our joint committees, but that will come at a later date.

At the San Francisco meeting of the House of Delegates, Dr. William Weston, Jr., presented a resolution asking the House to urge state medical societies to set up separate examinations in pediatrics. In reference committee, this was amended to read "the House of Delegates of the American Medical Association urges the state medical societies to use their influence with the various state boards to give proportionate consideration to pediatrics as is given to other fields of medicine."

Respectfully submitted,
PHILIP S. BARBA, *Chairman*

Dr. Hugh McCulloch reported for the Editorial Board and stated that there was no written report on PEDIATRICS at this time because progress was "status quo." The matter of appointment to the Editorial Board was then discussed. Dr. Grover F. Powers submitted a letter of resignation from the Editorial Board, which was accepted with extreme regret. Dr. Milton J. E. Senn was appointed to succeed Dr. Powers; Dr. Harold K. Faber of San Francisco, Dr. Rustin McIntosh of New York and Dr. Mitchell I. Rubin of Buffalo were appointed to the other three vacancies. Dr. McCulloch reported that a Navy contract with the printer had resulted in PEDIATRICS being published late since August. Dr. McCulloch also pointed out that with the increased costs of labor and paper it would probably be necessary to increase the subscription rates of PEDIATRICS sometime in the future. It was then voted that Dr. McCulloch's report be accepted.

A letter was read from Dr. Platou with respect to giving PEDIATRICS free to the Editorial Board. It is a custom that Editorial Boards receive the numbers of their journal free, and an Academy rule makes it necessary for them to pay the $10.00. After considerable discussion, it was pointed out that in order for the Academy to maintain PEDIATRICS as second class matter, it was necessary that it be sent to the total membership of the Academy subscribers. It was then voted that the Editorial Board be given an honorarium of $10.00 per year for each member to off-set the cost of PEDIATRICS. (At a later date, Oct. 17, 1950, it was voted to rescind this action.)

Dr. Shaw read his own letter to Dr. Grulee stating that he had had correspondence with Dr. McCulloch regarding a consideration by the Executive Board of the salary of the Editor of PEDIATRICS. Dr. McCulloch discussed this problem by saying that his inquiries were simply to locate the area where the question of the Editor's salary should be discussed; that it should be considered by the Budget Committee and Executive Board, and determined it be such that would be commensurate with the position; also, that it be a salary comparable to that offered in similar positions, and one that might be quoted in case a new editor might at some time have to be sought. Dr. Grulee stated that the consideration of the budget comes up at the June meeting of the Executive Board, so there will be time for the new Budget and Finance Committee to be informed, and for them to consider the present problem.

The report of the Publication Committee was read by Dr. Grulee in the absence of Dr. Lancaster. It was voted that the following report of the Publication Committee be accepted:

REPORT OF THE PUBLICATION COMMITTEE

Since our report last year, very little has happened of which the Board was not informed at the time through copies of statements from Mr. Thomas and through letters, and an interim report to the Board in June, from this committee.

In the meantime, Mr. Thomas has withdrawn his proposal as to a new contract and this matter need not be reviewed further.

It might be well to have before you the following figures (amounts in round numbers) for quick comparison of the status of PEDIATRICS after 2½ years of operation.

We are definitely out of the red but, as explained last year, there is opportunity for increasing our net revenue once the Academy set-up permits our taking over the publication and business management of PEDIATRICS.

Receipts	Vols. I-II-III	IV	V
Advertising	45,000.00	18,000.00	24,000.00
Subscriptions	73,000.00	25,000.00	24,000.00
Reprints		2,500.00	2,600.00
Totals	118,000.00	46,000.00	51,000.00

Expenses			
Editor	22,000.00	5,000.00	6,900.00
Publisher	32,500.00	11,500.00	12,000.00
Printer	57,700.00	23,000.00	28,000.00
Totals	112,000.00	40,000.00	47,000.00
Net	6,000.00	6,000.00	4,000.00

The Committee will meet in Chicago just prior to the Annual Meeting of the Academy and any further matters discussed will be brought to your attention through a supplementary report, should some action be required from the Board.

The Committee wishes to thank the Editor and the Publishing Agent, Dr. McCulloch and Mr. Thomas, for their cooperation and assistance throughout the year.

Respectfully submitted,
FRANK H. LANCASTER, *Chairman*
Ex. Officio, HUGH MCCULLOCH
EDGAR E. MARTMER

A report was given by Dr. Martmer who was asked to investigate the advisability and cost of a professional examination of the financial situation of PEDIATRICS. Dr. Martmer read considerable correspondence from 3 firms located in Chicago and New York who make such studies. Their bids for making the study were presented. The Executive Board accepted Dr. Martmer's report with thanks.

It was voted to accept the following report of the Committee on Geographical Distribution of Pediatricians:

REPORT OF THE COMMITTEE ON GEOGRAPHICAL DISTRIBUTION OF PEDIATRICIANS

We have continued to make surveys, but the requests for them have fallen off since July 1. Most of the recent graduates have apparently found location for pediatric practice.

There are plans in the making to improve, in the near future, the work in hand. These plans, when completed, will increase the scope and efficiency of this committee.

Respectfully submitted,
OTTO L. GOEHLE, *Chairman*

It was moved, seconded and carried to accept the following report of the Committee on Care of European Children:

REPORT OF THE COMMITTEE ON CARE OF EUROPEAN CHILDREN

Following is the summary of activities of the Committee on Care of European Children at the Reception Center, New York City, Oct. 30, 1948, to Aug. 31, 1950:

No. of Children: 659

Nationalities:

Polish	121	Yugoslavian	99
Polish Ukranian	79	Roumanian	14
Latvian	170	Russian	19
Lithuanian	71	French	2
Estonian	21	Norwegian	1
Czech	11	Austrian	11
Hungarian	15	German	10
		Undetermined	15
			659

Special Examinations:

Pulmonary	6—Examined by	Dr. Helen Eliasberg
Psychiatric	2—Examined by	Dr. K. Berke
Cardiac	16—Examined by	Dr. Franz M. Groedel
Ear, Nose, Throat	5—Examined by	Dr. J. Berberich
Eyes	23—Examined by	Dr. B. Kramer and
	1—	Dr. Leon Ehrlich
Orthopedist	3—Examined by	Dr. I. Balensweig
Luetic	2—Examined by	Dr. Koteen and
		Dr. David Bloom

During the period of this report, children were admitted to various hospitals. These include: Willard Parker, New York, St. Claire's, St. Joseph's, Sydenham, Morrisania and Bellevue hospitals.

At the New York Hospital, operations were performed for esophageal stenosis, epicanthus, cleft palate and a mediastinal dermoid cyst. Operations in the respective specialties were performed by Drs. McLean, Conway and Holman.

Additional groups of children are still arriving in this country. There is a possibility that the work of the committee will expand when the provisions of the new law are analyzed and other reception centers are opened in other parts of the country.

Respectfully submitted,
CARL H. SMITH, *Chairman*

Dr. Grulee then read a letter from Dr. Carl H. Smith requesting that the several doctors who had helped with the work on the care of European children be written a letter of thanks. This was put into the form of a motion, and was seconded and carried.

It was voted to accept the following report of the Committee to Cooperate with the U. S. Food and Drug Administration:

REPORT OF THE COMMITTEE TO COOPERATE WITH THE U. S. FOOD AND DRUG ADMINISTRATION

The Committee to Cooperate with the U. S. Food and Drug Administration has continued to function as in the past in a consultative capacity with this agency of the Government.

There have been a number of requests for opinions concerning a variety of products. Such information has been obtained not only from the committee but from other persons who have had particular experience with the product or substance in question.

Respectfully submitted,
WALDO E. NELSON, *Chairman*

It was voted to accept the following report of the Nominating Committee:

REPORT OF THE NOMINATING COMMITTEE

RECOMMENDATION:

For Vice-President (President-elect):

Dr. Warren W. Quillian
Coral Gables (Miami), Fla.

Respectfully submitted,
DENNIS H. KELLY, *Chairman*

Dr. Beaven then read a letter which had been prompted by several letters he had received, relative to revising the technic of electing officers. After considerable discussion, no official action was taken; the feeling of the Executive Board being that there should be no change for the present.

It was voted to accept the following report of the Committee (Section) on Surgery and it was further voted that the Section have the power to appoint its own Committee.

REPORT OF THE COMMITTEE (SECTION) ON SURGERY

A meeting of the members of this Section present at the San Francisco meeting of the Academy was held, and the following items were discussed:

1. Review of the applications for admission.
2. Consideration of the proposition that admission to the Section be by invitation followed by application.
3. The development of children's surgery in District IX, the names of 10 men being noted whose practice is limited to children's surgery.
4. The attitude of the American Board of Surgery toward children's surgery. (One member of this Section is on that Board.)
5. The appointment of an alternate for each member of the Committee.
6. The appointment of a program chairman for the Section, and the recommendation of Dr. Potts for that position.

There are at present 25 members of our Section, and several applications are pending.

The terms of Drs. Gross and Lozoya on the Steering Committee terminate with the Chicago meeting, and it is recommended that they be reappointed for a three year term, ending in 1953.

It is suggested that the name of the Steering Committee be changed to the "Committee on Surgery."

The Committee will probably consider a method of terminating the membership of those surgeons whose percentage of children's surgery falls definitely below the percentage of 90 required by the Board. There will no doubt be instances where this reduction in percentage of work is inevitable and justifiable, and it seems that a classification may be devised to which such members may be transferred if they wish to maintain close contact with the Section. In this connection, the Section may try to devise some classification for surgeons who are doing a high percentage of children's surgery in their districts but well below the required 90%, to the end that one purpose of the Academy—better care for all children—may be forwarded. Possibly, such surgeons might be selected by invitation to attend meetings of the Section. If any tentative solution of this situation is reached, it will be the subject of a further communication to the Board.

An application has been received from an orthopedic surgeon whose work is over 90% with children, but consideration of the application has been deferred because of the ruling of the Board at the Milwaukee meeting that, for the present, subspecialties in surgery should not be considered. This seems a wise ruling, and this application is mentioned simply for information and for reference when the time comes for further consideration.

To further carry out the objectives of the Academy, it is suggested that the Board initiate a study of how to improve the teaching and understanding of surgical conditions in infancy and childhood at either the undergraduate or postgraduate level because of the fact that, in general, the essential points of children's surgery are not being well taught at most universities. Because of crowded curricula, it may be advisable to develop such teaching during internships or residencies. The possibility of directing such recommendations through the American Board of Pediatrics to the American Board of Surgery might be considered because the latter is particularly insistent that candidates for certification be thoroughly qualified in pre- and postoperative care of patients, and it is the experience of many pediatricians that this knowledge on the part of many surgeons does not exist. Impetus for such improvement can well come from the Academy.

It is interesting to note the continuous increase of sentiment for better surgical treatment of children throughout the world. Centers for such teaching exist, for example, in Boston, Philadelphia and Chicago, and are developing in Rochester (N. Y.), Columbus and Minneapolis. Requests for men skilled in surgery of infancy and childhood are frequently received in these centers. In the 1950-52 Yearbook of the College of Surgeons, pediatric surgery is recognized in the geographic section by the word "pediatric" in parenthesis following "surgery," and in the alphabetical section by the code number "50" under which number the Surgical Section of the Academy is listed, that number being added at the end of the biographic sketch of each of our Section members who is also a member of the American College of Surgeons.

Dr. Lozoya, a member of our Surgical Committee, has just completed an extended trip during which he gave lectures on children's surgery at the University of Montevideo, Uruguay, and at six medical schools in Spain. The professor of children's surgery in Montevideo, Dr. Fontana, has requested material from us regarding the teaching of children's surgery. There is a Department of Children's Surgery with a professor in charge at the University of São Paulo, Brazil, and his application for membership in the Section is pending. A hospital is being built in Paris exclusively for the surgery of infancy and childhood. Instances of the recognition of this field are appearing with

increasing frequency. The Academy is in a position of leadership which it is hoped it may maintain.

It is recommended that this Section should not expand too rapidly, and that membership in it shall be kept highly desirable.

Respectfully submitted,
HERBERT E. COE, *Chairman*

It was voted to receive the report of the Committee on Drug Dosage in Infants and Children (see below). The Executive Board voted Dr. Grulee authority to seek funds from drug manufacturers or other interested sources to finance this investigative work relative to drug dosage in infants and children.

REPORT OF THE COMMITTEE TO STUDY THE PROBLEM OF DRUG DOSAGE IN INFANTS AND CHILDREN

A Committee to Study the Problem of Drug Dosage in Infants and Children was activated this summer with the following personnel: Dr. H. G. Poncher, Chicago, Chairman, Dr. A. M. Butler, Boston, and Dr. H. L. Barnett, New York City.

It was the opinion of the Committee that their first project would be in surveying dosages used currently and to obtain evidence supporting the validity of the appropriateness of such dosages and to see if they could correlate with such criteria now in current use such as body weight, body surface, or other criteria. It was also felt that the Committee could take advantage of research now being conducted at some of the clinics on renal excretion and that one or more of the drugs could be studied along with other purposes of the investigation. Financial support for such projects was needed and we got together with the Medical Section of the American Drug Manufacturers Association to see whether they would be interested in this project, as well as the American Academy of Pediatrics. Members of this Committee expressed very great interest in developing some valid basis for estimating dosage of drugs in children and offered financial support to the American Academy of Pediatrics for such a project.

After careful consideration, the Committee recommends that the American Academy of Pediatrics accept funds to be earmarked for such a project that may be carried out in such clinics best qualified to initiate this work. A cooperative study of this character is most desirable, and it is unanimously recommended for approval by the Executive Board of the American Academy of Pediatrics to accept such funds on behalf of the Academy.

Respectfully submitted,
HENRY G. PONCHER, *Chairman*

Dr. McElhenney presented to the Board the report of the Committee to Investigate Pensions and Annuities. Several plans had been studied, and these were presented to the Board. After considerable discussion, it was decided that many points were not clear in the minds of several of those present. A motion was made that the Secretary-Elect be asked to spend some time in getting this material in shape to present to the Board when it meets in June, and if necessary to gather other information. The motion was seconded and carried.

A motion was then made by Dr. McElhenney to give a pension of $5,000 a year to Dr. Grulee, beginning with his retirement July 1, 1951. The motion was seconded and carried.

Dr. Shaw asked the Executive Board for an authorization of Dr. Christopherson's salary and the date of his employment. It was voted that a special appropriation be made to cover Dr. Christopherson's salary of $16,000 a year, and that he be employed as of Jan. 1, 1951.

(In a later session on Oct. 17, 1950, the Executive Board rescinded the action as to the time of employment of Dr. Christopherson, and it was voted by the Board that Dr. Christopherson be employed as of Dec. 1, 1950. This was done to enable him to make a study of PEDIATRICS and to make a recommendation as to whether the Academy should take on the publication and business management of PEDIATRICS in the Central Office.)

It was voted that Mrs. Jewel Bundy be employed as Business Manager at a salary of $10,000 per year.

It was voted that Dr. William J. Orr be made Chairman of the Program Committee with an annual salary of $2,500.

The report of Dr. Beaven as the American Academy of Pediatrics representative to the Mid-century White House Conference on Children and Youth was accepted.

A letter was read from Dr. Park White stating that the account of the Missouri Study was being closed, and that a check was being sent the Academy in the amount of $305.05, which represented the final balance in the account. The Missouri group asked if this money could go to the new Advisory Comittee on Child Health. It was voted that this money be accepted with thanks, and that it be so allocated.

After a report from a committee made up of Executive Board members appointed to study and formulate the duties of the Executive Secretary, the following was adopted by the Executive Board: "That the newly appointed Executive Secretary, Dr. Christopherson, will spend a certain amount of time after January 1st in the company of the present Executive Secretary, Dr. Grulee, to become familiar with the type of work that has been delegated to him through the years, and that further duties will be assigned in subsequent meetings of the Executive Board."

The following was adopted as the duties of the Business Manager: "To manage the finances and business of the Central Office and of the meetings under the general direction of the Executive Secretary."

The following was adopted as the duties of the Treasurer: The Treasurer "Shall account for the funds of the Academy."

It was voted that "The By-Laws as proposed by the Committee on Legislation will stand as written regarding the above officers."

A letter from Dr. James G. Kramer was read relative to an experience in Ohio during the Ohio State meeting, preliminary to the White House Conference. This incident prompted a motion "that the Academy re-affirm its opposition to the extension of medical services under governmental aid without a Means Test." This motion was seconded and carried.

It was voted to accept the following report of the Liaison Officer to the American Medical Association:

Liaison Officer to the American Medical Association

It gives me a great deal of pleasure to make this, my report, as the Official Representative of the American Academy of Pediatrics to the AMA.

I regret very much to say that it was impossible for me to attend the meeting of the AMA in San Francisco this year; therefore, I could not, from the standpoint of personal attendance, say anything about the meeting, but having many friends who attended and who have reported to me since the meeting, I feel that they had a splendid meeting of the AMA. The report I have from my pediatric friends is that the relationship between the AMA and the American Academy of Pediatrics is better now than it ever has been.

I have used all of the influence that I possess with my friends in the official family of the AMA, which I am very glad to say includes some of the most influential ones now in command. I have written several letters to Dr. Elmer Henderson, the President of the Association, and have received as many replies from him, and the same thing applies to Dr. George Lull, Secretary and General Manager of the AMA. I have just had a very cordial letter from Dr. Henderson in which he expressed himself freely in saying that he feels that the relationship between the Academy and the AMA now is certainly much better than it has been in the past, and that he feels that all past differences are now healed and that the relationship can be stated as most excellent, and that Dr. Lull reports the same.

Dr. Joseph S. Lawrence in Washington, the official representative of the AMA there, has given me repeated reports on all the legislation presented to the Congress which reflects against the medical profession, and he is kind enough to say that the activities of the Academy through our representatives in Washington, were never better. My good friend, Dr. Joseph S. Wall, Chairman of the Legislative Committee of the Academy, of which I am also a member, has just written me a long letter in which he expresses himself in the most endearing terms, and he feels that our relationship with the AMA is the best in the history of the two organizations. I had previously written Dr. Henderson about Dr. Wall's work in behalf of the Academy before the Legislative Committees in the Congress, and through my efforts, together with those of Dr. Lawrence, Dr. Wall and Dr. Henderson, had several conferences in which there were mutual agreements relative to pending legis-

lative matters before the Congress that were detrimental to the best interests of the medical profession, and apparently there was no disagreement between us; on the contrary, we were all working shoulder to shoulder in behalf of the best interests of the Academy and the AMA.

I am indeed proud of the relationship that now exists between the Academy and the AMA, and I trust that nothing will happen to in any way disturb this relationship.

I feel that if our editors will closely inspect the articles that are to be printed in our official organ, PEDIATRICS, to see that there are none that will reflect on the good intentions of the AMA in their activities on behalf of the medical profession, this will go a long way toward keeping our relationship on its present delightful basis.

Dr. Lawrence sends me all of his bulletins and Capitol Clinics on the activities of the Congress, and I regretfully say that I have never in all my existence seen so much proposed legislation which would directly affect the best interests of the medical profession. I am constrained to believe that the socialistic trends in the Congress know no limit to which they would go in order to hamper the good intentions of our beloved profession. In this connection, I wish to call the attention of the members of the Academy and the medical profession as a whole, to the report of the special sub-committee of the Congress whose chairman happens to be my Congressman, the Honorable John Bell Williams from Mississippi. You will find a mention of this report in the last issue of the *Journal of the American Medical Association* on the activities of his committee in investigating Oscar Ewing's department. It is my privilege to have a full report of this committee sent me by Congressman Williams, and I assure you that I have never seen a more scathing denunciation of the activities of Ewing's department from any source and apparently all of it very much justifiable. I feel that the medical profession as a whole owes Congressman Williams and his committee a great debt of gratitude for their activities. His report was given to the Congress just prior to the time they considered Reorganization Plan No. 27; I feel that this report had a great deal to do with the defeat of that reorganization plan, and I am sure this is very gratifying to all of us.

Respectfully submitted,
HARVEY F. GARRISON, *Liaison Officer*

The report of Dr. Harold H. Mitchell, Liaison Representative to the APHA, was read by Dr. Grulee. The report included correspondence between Dr. Mitchell and Dr. Hugh Leavell, Chairman of the Executive Board of the APHA, relative to testimony of the APHA on Reorganization Plan No. 27. It was moved, seconded and carried "that the Secretary be empowered to write a letter to Dr. Mitchell, expressing in no uncertain terms our approval and appreciation of what he had done, and assure him that the Executive Board of the American Academy of Pediatrics is entirely in agreement with his sentiments, and that if there is anything that he would suggest that the Executive Board do, the Board would be glad to consider it, and feel it an honor to cooperate with him."

It was voted to accept the following report of the Liaison Representative to the Children's Bureau:

LIAISON REPRESENTATIVE TO THE CHILDREN'S BUREAU

Many pediatricians and others interested in the broad picture of child health have been concerned because of disturbed relationships between the American Academy of Pediatrics and the Children's Bureau, the two organizations representative of professional practice and teaching and governmental participation, respectively, which are most vitally interested in child health and welfare. The former attitude of mutual support and cooperation has shifted over the past decade or more toward one of mutual suspicion or antagonism.

After appointment to the liaison position between these organizations, this representative, as a result of prior discussions with a number of Academy members and more extended conversations with the Academy President, Dr. Edward B. Shaw, and Miss Lenroot, Drs. Baumgartner and Daily of the Bureau, concluded that full exploration of the present status and frank expression of opinions would be helpful toward clarifying the situation. A recognition of the proper fields of activity on the part of the two organizations, with development of a better attitude of cooperation where these interests coincide, may well lead to accelerated progress toward a common goal of improved child health. Where conflicts of philosophy or interest exist, frank recognition and discussion may lead to some acceptable resolution of the difficulties.

Additionally, some idea of the development of state programs in the fields of maternal and child health and crippled children, with which the practicing pediatrician, the teaching centers and governmental agencies are all concerned, was deemed to be of interest to the Academy membership. Finally, some expression from each state as to the status of planning to meet state needs as exhibited by the American Academy of Pediatrics' *Study of Child Health* and the possible cooperation of pediatricians, state and federal agencies in meeting these needs, was thought desirable. For these reasons, an inquiry which had been approved by the President of the Academy and discussed with Children's Bureau officials, was addressed to each State Chairman asking a reply to the following questions, preferably after consulting as many Academy members as possible:

1. How satisfactory is the working relationship between the pediatricians of your state and the agencies which direct maternal and child health and crippled children's services?
2. What criticism do you have of the way these services are conducted, of the policies of these state agencies or of the Children's Bureau, on the state or national level?
3. What suggestions do you have to offer concerning improvement of state maternal and child health and crippled children's services?
4. As a result of the Study of Child Health Services in your state, are there child health needs which the Children's Bureau, the state agencies, pediatricians and citizen's groups should be endeavoring to meet by joint action, financial assistance or more intensive study?

Despite the fact that this inquiry was made just before the summer vacation period and that it was recognizably difficult to answer because it involved—as several of the State Chairmen pointed out—such a wide spread of individual opinion and philosophy concerning child health that some Chairmen hesitated to speak for their members, answers were received from the Chairmen of 43 states, Hawaii and the District of Columbia. In eight instances, the State Chairmen had secured opinions from all or a large cross section of the state membership and an equal number stated that they were contacting the state members and would summarize their responses later. There were available to me opinions from 22 Academy members throughout the state of Illinois, in addition to reports from the Crippled Children's Clinic Committee of the State Medical Society, the Medical Administrative Assistant and the Chief of the Division of Maternal and Child Health, as well as the State Chairman. In Louisiana, there were answers from 31 of the 33 Academy members. It is pleasing to note these evidences of interest in pediatric problems throughout the country.

It is impossible, in a brief report, to reflect all of the shades of opinion expressed, but the answers will be summarized and typical or striking comments quoted under the separate headings.

I. Working relationships between pediatricians and the state agencies which direct maternal and child health and crippled children's services.

Thirty-one of the 45 Chairmen described this relationship as pleasant, cooperative, good, excellent, satisfactory or harmonious. In one state the relationship is described as "only fair," in another, the agencies are stated to do a good job, but not cooperatively, and in a third, the state and local health departments "work cooperatively but only in a small way." The Chairmen of three Midwestern states report that relationships are good with the Maternal and Child Health agency but not satisfactory with agencies responsible for crippled children's services; the reverse situation is reported from two southern states. Other comments are "there is not much dissatisfaction, but little discussion"; "In our state there are so few pediatricians that there is very little cooperation"; "Several of the pediatricians in the state, including myself, are not too happy with the present set-up of the Crippled Children's Service . . . our Maternal and Child Health Committee has not been too active." One Chairman offers no comment; one from the far West states that their pediatricians have very little to do with the Crippled Children's Services, while an Eastern State Chairman says that most pediatricians in his state carry on their practices uninformed of and independent of state agencies. The sources of these comments suggest, as is obvious after study of all reports, that satisfactory or unsatisfactory relationships have no regional distribution; they often relate to personalities within the given state.

Exceptionally good programs have been developed on a cooperative basis in some states. In Maryland, the Director of Maternal and Child Health and Crippled Children's Services of the State Health Department is Secretary of the Committee on Infant Care of the State Medical Society; this committee is composed largely of Academy members and is quite active within the state. In

North Carolina, the premature program is financed by the Children's Bureau, administered by the Bureau of Maternity and Infancy of the State Health Department and has an advisory committee from the State Chapter of the Academy. The Ohio Maternal and Child Health Service maintains close relationship with Academy members through an advisory board, consulting pediatricians before instituting programs. Through similar liaison committees with state medical societies or pediatric societies, cooperative planning and action are reported as very effective in Michigan, New York, Washington; in Hawaii, representatives of governmental agencies, professions and the public coordinate their efforts through the Oahu Health Council. Several Chairmen state that relationships between practitioners and state agencies are improving progressively as a result of cooperative activity during the Academy Study.

II. Criticism of the services and policies of the state agencies or the Children's Bureau.

(a) State Agencies. Fifteen of the 45 Chairmen stated that they had no criticism to offer; one thought that the agencies in his state were doing the best they could with the means at their disposal; eight Chairmen failed to answer or stated that they had no data, and six had no specific criticism except for the desirability of improving the bilateral relationship by the development of advisory committees, increased use of pediatricians by the state agencies, more frequent conferences between agency directors and practicing pediatricians and better general public relations. One Chairman stated that the Maternal and Child Health Agency in his state should avoid making impractical suggestions and recommendations, resulting largely from failure to consult men in practice. In one state, relationships depended too largely on the attitude of agency administrators; another was adversely affected by internal strife within the agencies.

Specific objections were: Volume of patients handled in clinics too large for efficiency (2); services not confined to families unable to pay for them (2); fees to pediatricians too low (2). The latter objection related chiefly to crippled children's services, especially in comparison with fees paid orthopedists. In four states, the objection was offered that orthopedists controlled or dominated the crippled children's services and pediatricians were rarely consulted about policies. The policies of crippled children's services, attributed by one State Chairman to over-all policy established by the Children's Bureau, of accepting children only for complete care or of refusing to allocate funds for any service to crippled children not under control of the agency, was criticized by several Chairmen and by other Academy members from Illinois and Louisiana. After reporting that his state membership would be almost unanimous in praising the satisfactory relationship with state agencies, the Wisconsin Chairman stated that the only possible criticism which some members might offer is to the attempt "to force graduate education and clinics on doctors who have no interest or desire to carry on such activity." Academy members from Illinois and Louisiana who have worked with the agencies mention: "too much red tape"; "too much overhead, therefore work is manufactured"; inadequate screening; no decentralization in recognizing local problems; patients or reports not returned to referring doctors; solicitation of private patients by nurses; better social service control.

(b) Children's Bureau. Many of the Chairmen did not mention the Children's Bureau specifically. Ten were critical because of their belief that the Bureau favored governmental control of medicine; several of these quoted the former Chief of the Bureau as publicly expressing the desire to extend E.M.I.C. to all mothers and children, also as stating that the Bureau would be satisfied when medical care was available to every child in much the same manner as public education. A Western State Chairman expressed doubt that any relationship with the Children's Bureau satisfactory to his members could be worked out. A Midwestern Chairman objected to attempts by the Bureau to dictate policies within the state, largely through control of allocated funds. Another has no complaint with planning which occurs at the federal level, but objects to the tie-in of this planning with power exerted through federal funds.

On the other hand, the Chairmen of an Eastern and a Southern state report that there is no criticism of the Bureau since E.M.I.C. was discontinued. After a meeting of the Kentucky members of the Academy wherein these matters were discussed fully, Chairman Nicholson states "The Kentucky pediatricians seem to feel more kindly toward the Children's Bureau at present than in the past because they feel that the Bureau's stand on state medicine has changed considerably in the past few months." A Midwestern State Chairman says that the Bureau has always been helpful in that state; several members from Illinois and Louisiana expressed the opinion that the Bureau had trended to socialism in the past, but were not critical of the present officials. The Chairman of an

Eastern state believes that the suspicion engendered by open advocacy of government control of medicine by the Social Security Administration is reflected upon the Children's Bureau and all other agencies under his control; that all health services in the Federal Security Agency would have better relations with the profession if this situation could be changed.

III. Suggestions for improvement of maternal and child health and crippled children's services.

Many Chairmen alluded to the preceding criticisms as offering obvious suggestions, but many constructive suggestions and plans were offered. One-third of those reporting thought the paramount need was for state-wide concerted planning and consultation between administrators of agencies and practicing physicians. Several stressed the desirability of the state agencies' publicizing their plans and programs among the profession and to students in medical schools, as many practicing physicians (including Academy members) are not aware of these programs or do not know how to use or cooperate with them. It is gratifying to learn that in several states, the distribution or discussion of the present questionnaire stimulated or activated plans toward this end of improved mutual understanding.

In half a dozen states, improvements were considered as progressing satisfactorily. In as many more, there was crying need for state matching funds for the regular programs of these agencies and in four others, funds were thought to be badly needed for special activities which were already planned. Two Chairmen expressed a preference for state financing without federal assistance. In six states, the desire was evident to have funds for crippled children who were not entered in the state agency program. Development of a more adequate control and application of a means test to recipients of state agency care was stressed by three Chairmen.

Personnel needs were cited in a number of states, especially for individuals with pediatric training to direct these agencies. Several Chairmen thought that progress in this direction would enhance the effectiveness of the state programs and would lead to consultation and cooperative planning with the practicing pediatricians.

New or expanded programs for rheumatic fever, prematures, school health, child guidance and mental hygiene, tuberculosis, speech, hearing and visual defects, convalescent care, education and vocational training of crippled children (especially cerebral palsied children) were among the special needs listed in the various states. In several instances, changes in the basic state legislation under which the programs set up were cited as necessary before medical cooperation would likely improve.

IV. Child health needs developed by the Study of Child Health Services, which the Children's Bureau, the state agencies, pediatricians and citizen's groups should be endeavoring to meet by joint action, financial assistance or more intensive study.

A wide range of expression of opinions developed in response to this question. From about an equal number of states, opinions were expressed that federal as well as state funds would be needed to meet the programs which were planned or that it was deemed desirable in that particular state to meet these needs with local and state funds, with a minimum of federal funds and control. One Chairman states "At present, Maine has not enough money, but I am thankful to say there is no immediate desire to dip its hands into the National Treasury." Quite a few State Chairmen indicated that, since conclusion of the State Study of Child Health Services, cooperative programs between the pediatricians, the state agencies and the Children's Bureau already are in progress and in these instances the pediatricians were satisfied with the way these programs were developing. As a result of a recent state-wide meeting concerning school health, a State Pediatric Society was formed in Montana. Considerable interest is manifested in Illinois in the formation of a state organization of Academy members and the opinion was expressed repeatedly that such organizations would enable the members to be much better acquainted with state and federal agencies and in a much better position to develop cooperative planning. The Kentucky Chairman states that a great deal of progress in pediatric matters has developed in his state as a result of the Study of Child Health Services. Many other states indicate that their pediatric societies are more active since the Study and, in a number of instances, these organizations are enlisting the aid of the State Medical Societies, the state health agencies and citizen's groups in planning and carrying out needs demonstrated by the Study. Numerous special programs are listed which in the various states are deemed worthy of the type of cooperative planning and financing outlined by this fourth question. Many of these have already been listed in Section III above, in addition to which may be mentioned: state funds for

hospitalization of indigent children, care of epileptic children (especially those of normal or superior intelligence), increased pediatric training, dental services and school health programs.

Several pessimistic notes were struck. One State Chairman objected to the holding of the White House conference because of the war emergency. Another stated that, in his opinion, the Study of Child Health Services did not demonstrate anything in his state which was not already known and indicated that it had been of little value in stimulating pediatric progress. A third gave as his opinion that state agencies should avoid new programs or expansion in this particular state, but expressed a need for constructive coordination of local and state agencies in the field of child health. One suggestion was offered that Dr. Baumgartner, as an officer of the Children's Bureau and a member of the Academy, could improve relationships markedly by visiting each state and discussing plans and programs of the Children's Bureau with the pediatricians.

Summary

It has been a refreshing experience to me, as a practicing pediatrician, to serve as Liaison Officer from the Academy to the Children's Bureau during the past year, to talk with practitioners of pediatrics, teachers, state and federal employees of the agencies interested in child health and to have the opportunity through this study of sampling the varied experiences and opinions of Academy members. I am impressed with the fact that American pediatrics is by no means static but is wide awake, thinking and acting. It is also encouraging for one who participated on a state and national level in the difficult and controversial Study of Child Health Services conducted by the Academy to learn that, if nothing else had been accomplished, there are almost nationwide evidences of increased interest in child health and stimulated planning to meet its needs.

From the present study, I would infer that in most states the relationships between practicing pediatricians and state agencies involved in child health are satisfactory to excellent but there is general recognition, even in these states, that mutual education and understanding is needed and can best be developed by better acquaintance and more frequent consultations between these groups. Statewide planning of this type, trained personnel and enhanced funds will be needed in many states if the numerous programs for improvment of child health, which are already recognized, are to be carried out. There seems to be rather general agreement that planning should proceed on local, state and national levels but that establishment of policies and control of funds should preferably proceed on the state level through consultation between directors of state agencies and practitioners of medicine in the various fields involved. There are evidences that relationships between pediatricians of this country and the Children's Bureau are improving but that old suspicions and present misunderstandings should be discussed very frankly and advantage should be taken of every opportunity which offers better understanding and cooperative action on a fair basis. Many needs in the field of child health are evident which can best be met by coordinated planning and cooperative action between the practitioner, the teacher, the state and federal employee and the general public, but this is only to be accomplished without undue friction if proper fields of endeavor are recognized and if attitudes of suspicion and tendencies to work at cross purposes are eliminated.

May I express my sincere appreciation to all Academy officers, officials of the Children's Bureau, State Chairmen and members of the Academy who have so willingly given of advice and help in this study, and especially to the State Chairmen of the Academy who have given generously of their time and whose thoughts are reflected in this report.

Respectfully submitted,
CLARENCE H. WEBB, *Liaison Officer*

It was voted to accept the following report of Dr. C. F. McKhann, Liaison Officer to the National Research Council (read by Dr. Martmer):

LIAISON OFFICER TO THE NATIONAL RESEARCH COUNCIL

The annual meeting of the Division of Medical Sciences of the National Research Council was held on May 20, 1950. Dr. Milton C. Winternitz, acting chairman of the Division, presided.

Dr. Detlov W. Bronk reviewed the problem of support for scientific research in this country, preparation of individuals for further programs of investigation, scientific advice to government

and private agencies, cooperation of the National Research Council with other research councils, and international activities.

The National Research Council operates through a number of committees. Reports were received from the Committee on Problems of Alcohol, the Committee on Atomic Casualties, the Committee on Radiation Cataracts, the Committee on Research in Endocrinology, the Medical Fellowship Board, the AEC Postdoctoral Fellowship Board, the Committee of Human Reproduction, the Committee for Research in Problems in Sex, the Committee on Growth, and the Committee on Veterans Medical Problems.

By vote of the Council the Committee on Aviation Medicine was suspended. The Committee on Blood and Blood Derivatives was activated to a larger extent than it had been, under the chairmanship of Dr. Charles A. Janeway. The direction of this committee will require the expenditure of a great deal of time on the part of Dr, Janeway. Dr. Joseph Stokes, Jr., was appointed to the committee because of his long interest in the problem of sterilization of blood. Other committees that were mentioned as playing an increasingly important role were the Subcommittee on Burns, the Committee on Radiology, and the Committee on Ophthalmology.

A considerable question has arisen in the National Research Council in recent years as to whether under the existing set-up a Division of Medical Sciences achieves any useful goal either for the Division or for the member societies. The Division is run pretty much by the permanent staff and by several officers whose terms have become self-perpetuating. Members of the individual societies are chosen for three years and it has been the policy not to have a member reappointed, hence the difficulty in having useful contributions from members of the constituent societies. An *ad hoc* committee to consider the membership of the Division made the following suggestions:

"that the societies consult with the chairman on the appointment of their representatives, who should whenever possible be in an active role in research or fellowship programs in which the National Research Council is interested;

"that the representatives be provided with an opportunity to familiarize themselves, perhaps at an informal meeting, a day ahead of the Annual Meeting with such activities of the National Research Council as concern their respective societies;

"that the representatives inform their societies of the National Research Council activities either at their meetings or through publication in their journals;

"and that the representatives be responsible for brief reports on the research of their organizations."

The consensus of the various delegates is in accord with the views of this committee that the National Research Council does not achieve the aims for which it has been established since there is inadequate participation of the member societies. Undoubtedly from this discussion more good will come and probably some plans for the reorganization of the Council will be made.

I believe since my term on the Council will expire at the end of this year I should like to call this report to the attention of whoever is elected as my successor.

Respectfully submitted,
CHARLES F. MCKHANN, *Liaison Officer*

The following report of Dr. Margaret Mary Nicholson, Liaison Representative to the National Maternal and Child Health Council (read by Dr. Grulee), was accepted:

LIAISON OFFICER TO THE NATIONAL MATERNAL AND CHILD HEALTH COUNCIL

The Fourth International Congress on Obstetrics and Gynecology was held in the Hotel Statler in New York, May 15, 1950.

The Academy has decided against having an exhibit, but to encourage pediatricians to exhibit subjects of interest to obstetricians. This was successful. Is it the desire of the Academy that this method of assuring obstetricians of the Academy's interest in the newborn be repeated at the next meeting?

Information was gathered and dispensed concerning lectures, fellowships, research grants and postgraduate courses concerning the newborn. A few communities asked for and received the speakers who will enhance the position of the pediatrician in charge of the nursery.

The American Committee on Maternal and Child Welfare publishes the journal *The Mother.* Does the Academy desire to have an article for publication therein?

The work of the National Maternal and Child Health Council and the National Committee on Maternal Health is gradually evolved in such a manner that these organizations have ceased and the Committee on Maternal Welfare is continuing any uncompleted work. What is your desire concerning the title of this representation?

Respectfully submitted,
MARGARET MARY NICHOLSON, *Liaison Officer*

It was voted that Dr. Nicholson be given authority to continue to invite individuals and to arrange for individuals' exhibits at the meetings of obstetricians and of maternal and child welfare groups. It was also voted that Dr. Nicholson be authorized to publish an article in *The Mother,* as the Liaison Officer of the Academy to the American Committee on Maternal Welfare.

It was voted to accept the following report of Dr. George F. Munns as Liaison Officer to the National Society for Crippled Children and Adults (read by Dr. Grulee):

NATIONAL SOCIETY FOR CRIPPLED CHILDREN AND ADULTS, INC.

A completed and detailed report of the activities of the National Society for Crippled Children and Adults is being presented in mimeographed form to the members of the Executive Board at this meeting.

During the past year, the Liaison Officer has consulted at various times with officers of the National Society for Crippled Children and Adults concerning speakers for their programs, articles to be published in their journal and other matters in which they felt pediatric advice was needed.

Examination of the report prepared by Mr. Linck clearly reveals that his organization is extremely active in many things which are of interest to pediatricians and our cooperation with them should always be encouraged.

Respectfully submitted,
GEORGE F. MUNNS, *Liaison Officer*

The report of the Liaison officer to the Parent-Teachers Association, by Dr. Gerald M. Cline, had been read previously in the report of the Committee on Cooperation with Non-Medical Groups, and was accepted.

Dr. Grulee read the following report of Dr. Rustin McIntosh for the Sixth International Congress of Pediatrics, and it was voted to accept this report:

REPORT OF THE SIXTH INTERNATIONAL CONGRESS OF PEDIATRICS

Since the American Academy of Pediatrics did me the honor of appointing me one of its delegates to the Sixth International Congress of Pediatrics, I think some sort of report from me is in order.

The Congress was held, was considered a great success, was attended by a very considerable number of American pediatricians, including of course many members of the Academy, who gave a good account of themselves both professionally and socially.

In my judgment, and in that of a number of others, the program of the Congress was open to criticism because of its inclusion of too many items, with all too little evidence of critique and judgment in the economic selection of contributions. The exact makeup of the program was left to the host authorities, as is customary; but while I am not thoroughly familiar with the exact policies followed in the admission of papers to the program, I gained the distinct impression that a number of people submitted titles on their own, without screening or authoritative recommendation, with the result that some of the papers were not such as one could be proud of. This applied to some of the American contributions, as well as others; and it seems obvious to me that adequate machinery ought to be set up for making certain that a given country's contributions to the program should be truly representative of the best that can be put forward. This matter, of course, does not concern the Academy immediately but is reported for information. I shall let Dr. Holt, as general secretary of the International Pediatric Congress, have a copy of these remarks.

The scientific exhibits were, on the whole, excellent and in general superior to the papers given from the platforms. The effective development of scientific exhibits is essentially an American contribution, in which the Academy has had a large hand, and it is interesting to see it gain favor and appreciation universally. Although it would seem to me that here, as in the program of speeches, greater care ought to have been taken in the acceptance of individual exhibits, the penalty to the consumer, the average attendant at the Congress, is not so severe since he can rather quickly judge whether it is worth his time to examine an exhibit with care. Some have even suggested that the scientific exhibits be made the backbone of the Congress program, relegating the speeches to subordinate position; this feeling was expressed not only by Americans but by some pediatricians from other countries.

The organization of the Congress was not entirely satisfactory so far as the recognition of official delegates or representatives from established pediatric organizations is concerned. While various American organizations, the Academy included, sent official representatives to the Congress, no occasion was provided in Zurich, so far as I know, for the official reception and recognition of such representatives. The local Swiss crowd, under the leadership of Professor Fanconi, called together an organizational meeting in the middle of the Congress. In their laudable effort to arrange for a small enough group so that business could be negotiated with reasonable dispatch, they issued emphatic announcements saying that not more than two representatives from any one country were to attend. So far as I understand the matter, this directive did not follow any accepted rule or even custom of International Congresses, and it struck me as being rather high handed. Various American representatives and delegates got together and agreed on the selection of the two who were to attend the meeting. I was not one of them. I could not avoid the feeling that those of us who represented established pediatric organizations like the American Academy of Pediatrics were being let down by a combination of arbitrary ruling and the throw of the dice. Moreover, I understand that the French sent half a dozen representatives to Dr. Fanconi's meeting. The whole procedure needs to be regularized, and I believe the whole organization would benefit if it were modified so that emphasis were taken off individuals as such, and likewise off countries, and reposed instead on the representation of established pediatric organizations such as the American Academy of Pediatrics. I don't mean to imply that any great harm was done, but it is clear that there had been a lot of unnecessary and rather amateurish fumbling around.

In closing I should add the statement that a great many individual pediatricians, from a wide variety of countries, took particular pains to express their appreciation of American hospitality extended to them during the Fifth International Congress which was held in New York in 1947. Besides this, the Swiss outdid themselves in kindness and hospitality. These things are all excellent for international relations. No Russians were present, nor were there any pediatricians from Czechoslovakia, Hungary or Rumania. One or two Poles managed to get out from behind the Iron Curtain, but they kept their remarks confined strictly to business.

I was and remain well aware of the privilege of representing the American Academy of Pediatrics in Zurich.

RUSTIN MCINTOSH

Dr. Harold W. Dargeon read the following report of the Tumor Registry Committee which was accepted by vote:

REPORT OF THE COMMITTEE ON TUMOR REGISTRY

Committee Meeting No. I, June 15, 1950.

Present: Drs. Fred Wilke, John Franklin, Alfred Vignec and the Chairman.

The policies and program of the Registry were outlined to the new members.

Suggestions received from the members of the Executive Board and members of this Committee concerning the pamphlet "Childhood and Cancer" were discussed. Revisions were completed and the manuscript was forwarded to the Secretary-Treasurer of the Academy.

The report entitled, "The Children's Tumor Registry—A Review 1940-1950" was discussed. Several revisions were made and the report was forwarded to the Assistant Secretary of the Academy.

Committee Meeting No. II, Sept. 12, 1950.

Present: Drs. Fred Wilke, John Franklin and the Chairman.

REGISTRATION

The following cases have been submitted to the Registry since the report of Sept. 26, 1949:

Neuroblastoma	2 mo.
Neuroblastoma	28 days
Hyperplastic lymphadenitis	3 yr.
Eosinophilic granuloma	3 yr.
Eosinophilic granuloma	8 yr.
Reticuloendotheliosis, type unknown	15 mo.
Osteogenic sarcoma	13 yr.
Leukemic lymphoma	Age unknown
Leukemia	6 mo.
Hodgkin's granuloma	5 yr.
Osteomyelitis	4 yr.
Wilms' tumor	3 yr.
Wilms' tumor	2 yr.
Wilms' tumor	3 yr.
Meningocele	11 yr.
Inflammatory hyperplasia	10 wk.
Plexiform neuroma	7 mo.
Embryonal rhabdomyosarcoma	2½ yr.
Lymphosarcoma	5 yr.
Adrenal pheochromocytoma	13 yr.
Benign adult teratoma	6 mo.
Regenerative bone	10 yr.
Adenomatous polyp	54 yr.
Fibroma	10 mo.
Hemangioma	4 yr.
Hemangioma	8 mo.
Hemangioma	9 mo.
Malignant hepatoma	3½ yr.
Angioma	4 mo.
Neuronevus	8½ yr.
Granulosa cell tumor	2 yr.
Ovarian cyst	newborn
Cirrhotic liver	16 mo.
Ewing's tumor	12 yr.
Embryonal "glandular" carcinoma	10 mo.
Dysgerminoma	fetus
Neurilemma	10 yr.

EDUCATION

Exhibits: (Title and Location shown)

"The Control of Cancer in Childhood"

Chicago Medical Society, Chicago, Feb. 28 to March 3, 1950.

Territorial Medical Association, Hilo, Hawaii, May 4 to 7, 1950.

International Congress of Pediatrics, Zurich, Switzerland, July 10 to Aug. 1, 1950.

This exhibit has been requested for the American Medical Association Convention, Cleveland, Dec. 5 to 8, 1950.

"Congenital Tumors with Structural Defects in Children"

New York State Medical Society, New York City, May 8 to 12, 1950.

American Medical Association, San Francisco, June 26 to 30, 1950.

This exhibit will be used at the Annual Meeting of the American Academy of Pediatrics, Chicago, Oct. 16 to 19, 1950.

Loan of this exhibit was requested by the U. S. Army for educational purposes in Japan. The Argentine Association of Pediatricians and the Seventh International Assembly of the International College of Surgeons, Buenos Aires, Argentina, also requested the exhibits "Tumors of

Childhood" and "Osseous Tumors of Childhood." Due to the military situation in the Far East and customs problems in Argentina, arrangements to send these exhibits were cancelled.

LECTURES

Data from the Registry were used for lectures at the following meetings:

American Academy of Pediatrics, New Jersey, Jan. 25, 1950.
Woman's Medical College, Philadelphia, Feb. 7, 1950.
Chicago Medical Society, Chicago, March 1, 1950.
Paterson General Hospital Staff, Paterson, N.J., April 18, 1950.
Bellevue Hospital Alumni, New York City, May 3, 1950.
Chester County Medical Society, Coatesville, Pa., May 10, 1950.
Pediatric Section, Westchester County Medical Society, New York City, April 27, 1950.

Lantern Slides:

Loan sets of slides have been forwarded to one medical school and also to the Department of Health, Territory of Hawaii.

RESEARCH

1. The statistical survey is nearing completion. Over 500 cases have been coded thus far.
2. The survey of the mortality from neoplastic diseases in 1947 in the City of New York has been completed. The details of this survey will be presented separately. It is of some interest, however, to note several findings here:

   There were 196 deaths due to cancer and allied diseases from birth to 14 years of age.

   The well known problems of infancy account for most of the deaths during the first year of life; neoplasms are responsible for 0.31% in this age group. From the 1st to 14 years deaths from neoplastic diseases were 16.8%.

CORRESPONDENCE

The Committee was informed of the correspondence with various officers of the Society. The members of the Comittee concurred in the opinion that:

(a) Revision of the membership pattern of the Committee was now desirable,
(b) The title of the Committee should not be altered in any way,
(c) The program of the Registry should be followed in various areas throughout the country and Associate Registries established in various areas—perhaps on the geographic basis of Academy Districts.

GRANT-IN-AID

A balance of $4,575.92 remains in the grant from the Babe Ruth Foundation.

Application for continuation of the grant-in-aid has been made to the American Cancer Society (the administrator of this fund) by the Secretary-Treasurer of the Academy.

Respectfully submitted,
HAROLD W. DARGEON, *Chairman*

Upon the recommendation founded by the Tumor Registry Committee, it was moved, seconded and carried "that in the sense of the Academy, no research study with radio-active isotopes shall be made on children by any investigator without the approval of the Committee for Human Use of Radioactive Isotopes of the Atomic Radio Commission." Also, upon recommendation of the Tumor Registry Committee, the following motion was made, seconded and carried: "That the Executive Board approves the recommendation of the Tumor Registry Committee, that the use of fluoroscopes and radiographs in institutions shall be limited to members of the staff—either medical or lay—who have been designated as qualified by the radiologists or roentgenologists; that a special sheet should be included in all hospital and clinic charts for roentgens per minute, exposure time and operator, and that all institutions be requested to use timers on fluoroscopes."

It was voted that the Tumor Registry Committee be asked to prepare a resolution relative to the use of the fluoroscope and radiogram by general practitioners and others who are not radiologists or roentgenologists, and to present it at a later time. The Tumor Registry Committee was given authority by the Executive Board to appoint such consultants and special committees as they require.

A letter was read from Dr. Wilson Grubb regarding the alarming type of publicity that is presented

regarding poliomyelitis. A copy of this letter was sent to Dr. Hart E. Van Riper, Medical Director of the National Foundation for Infantile Paralysis. A letter from Dr. Van Riper was read. It was voted that the Secretary be instructed to write a letter to Dr. Grubb and to send a copy to Dr. Van Riper, to the effect that the Executive Board had noted his letter, and the reply from Dr. Van Riper, and that he (Dr. Grubb) should be encouraged to make constructive criticism along this line.

A letter from Dr. L. Emmett Holt was read, asking that the Academy become a member of the International Pediatric Association; the Academy would be taxed one Swiss franc per member per year (about $700.00). It was voted to table the question for further consideration.

A letter was read from Dr. James C. Carter, in which he stated that a "Grandfather's Cabinet" be formed in the Academy that would determine the long-range program. It was voted to table the proposition for the time being.

A letter was read from Mr. Robert Halterman, asking if the Academy wanted to have their certificates put up in Perma Plaque, as they were done before the war. The Secretary was instructed to write that the Academy did not wish to take the matter up at this time.

A letter was read from Dr. Charles Bloomer of the American Speech and Hearing Association suggesting the possibility of the Academy and the American Speech and Hearing Association holding a joint meeting. The matter was referred to Dr. Orr, Chairman of the Program Committee.

A letter was read from Dr. William Penhale, which brought up the question from the New Hampshire Pediatric Society as to what the place of pediatricians would be in the armed forces, and suggesting that the American Academy of Pediatrics try to do something about seeing that pediatricians are used in suitable fields. Dr. Grulee told of a letter he had received from the National Research Council asking him to answer just such a question. A reply was made suggesting that pediatricians could best be used in the fields of contagious diseases work, public health and nutrition. It was voted that the Executive Board approved the manner in which Dr. Grulee handled the situation, and he was directed to follow up on this as indicated.

A letter was read from Dr. Jean Short, asking if it would be possible for the Academy to prepare in mimeographed form a summary of the presentations and discussions held at the Annual Meeting. It was voted that this did not appear to be feasible at this time.

It was announced by Dr. Grulee that the next Areal Meeting would be in Cincinnati, March 26 to 28, 1951; that the next Annual Meeting would be in Toronto, Canada, Oct. 22 to 25, 1951; that an Areal Meeting would be held in Washington, D.C., early in May 1952; that an Annual Meeting would be held in Chicago in October 1952; that an Areal Meeting would be held in Boston the latter part of April 1953, and that no arrangements for an Annual Meeting for 1953 had been made.

A letter was read from Dr. Felix Hurtado suggesting that "Havana, Cuba, be selected as the seat of the Annual Meeting of the Academy in 1953. By this way the American Academy of Pediatrics will call its first annual meeting in the city of District IX. It would be nice to celebrate the Annual Meeting some days before the International Congress. I request the kind cooperation of the members of the Executive Board in an effort to obtain the greatest success of this meeting in Havana." It was voted to notify Dr. Hurtado that the proposition of going to Havana in 1953 would be given serious consideration.

Letters were read from Drs. Hill and Wall discussing the method of electing members to the Academy. After a lengthy discussion, it was voted that it be the recommendation of the Executive Board that since Article 4 in the By-Laws already covers the steps that Dr. Wall suggests that there be no change in the procedure for electing fellows at this time.

The report of the Committee on Legislation was presented by the Chairman, Dr. Joseph S. Wall. The proposed changes in the Constitution and By-Laws as recommended by the Committee to make the Constitution and By-Laws conform to the spirit of the reorganization of the Academy were gone over and debated and passed individually by the Executive Board in advance of their presentation before the Business Meeting of the Academy for adoption.

These modifications of the Constitution and By-Laws will appear in the 1951 edition of the Constitution and By-Laws of the Academy.

In addition, one more change was approved for the By-Laws to help clarify the position of committees and sections of the Academy.

The following motions were also made, seconded and carried:

That the Executive Secretary send a letter expressing the appreciation of the Executive Board for past services on the Editorial Board of PEDIATRICS to Dr. Irvine McQuarrie and to Dr. Grover F. Powers.

That a congratulatory letter be sent to Dr. William H. Sebrell, an Associate member of the Academy, who has been made the Director of the National Institute of Health at Bethesda, Md.

That the Associated Press be given the names of the newly elected fellows of the Academy.

That a list of the names of the men who have passed their American Boards be sent to the District Chairmen of the Districts concerned.

The following report of the Committee for Improvement of Child Health was read by Dr. Warren Sisson:

REPORT OF THE COMMITTEE FOR IMPROVEMENT OF CHILD HEALTH

This, the final report of the Committee for the Improvement of Child Health, concludes a chapter of the Academy's activities. The Committee can best be considered as an experiment to solve some of the Academy's more urgent commitments. It has learned by trial and error in some measure to understand its purpose, and we trust has recognized its areas of activity.

The Committee for the Improvement of Child Health was organized to meet an anticipated need created by the Study of Child Health Services. No one was able to define its scope, but it was clearly recognized that certain responsibilities were created by the Study and the existing organization of the Academy did not afford facilities for meeting these new assignments. The Academy was put in the position of being obliged to act upon and interpret the findings of its Study of Child Health Services. It was also clearly the responsibility of the Academy through its new Committee to extend the findings of the Study where this involved a wider distribution of medical care of a high standard to more children. This challenge of quality distribution of medical care had to be met, and now the newly organized Academy must continue indefinitely seeking data and solutions of problems that concern the health of children.

The Committee, formerly under the able leadership of its Director, Dr. John P. Hubbard, has by force of circumstances been obliged to restrict its activities, but at the same time retain the fundamental objective of its formation—the distribution of better care to more children.

Of necessity, the Committee has changed its directorship twice. After Dr. Hubbard resigned, the reins fell into the hands of Dr. Glidden L. Brooks, who in turn accepted another position as the Committee had recommended that its activities be absorbed in the new Academy Organization in its central office.

The Committee was left in a very embarrassing position with no Director, no Executive Secretary, but with empty offices, silent typewriters, with adequate funds and a great responsibility to turn over intact its goods and chattels, its accomplishments, its unfinished business, to the new Academy organization.

Your President, Dr. Shaw, finally persuaded the Chairman of the present Committee to accept the interim direction of the affairs of the Committee. The Philadelphia office was dismantled by Dr. Brooks and it remained to dispose of certain equipment and ship needed articles to the central office and to my office in Boston. Fortunately, it was possible to acquire the part-time assistance of an experienced secretary. Without her help, the stewardship of the Committee would have been a real burden.

Before the Philadelphia offices were vacated, we were able to obtain a partial rebate of $100 for the unexpired lease.

The previous publications of the Committee, such as "The Road Ahead for Better Child Health," were sent to the central office for further distribution. It has been amazing to see the continuing although lessening demand for this brochure.

The duties of the Chairman of the Committee have been, first, to carry on the routine correspondence which involves inquiries regarding all facets of the Study. For instance, we have just answered an inquiry concerning the problem of visiting hours for parents in a children's hospital. This is a very important subject and we were able to give certain direction to the request. It is surprising at times to realize how many people throughout the United States have looked to the Committee for guidance on all matters which pertain to better child health.

One of our first assignments was to review the state report publications. We found that only 30 had been published by June 1, when we officially took over the interim directorship. These were: Alabama, Connecticut, Delaware, District of Columbia, Florida, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Massachusetts, Mississippi, Missouri, New Jersey, New Mexico, New York, Western New York, North Carolina, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Virginia, Washington, Wisconsin and Wyoming. Since then, the Maryland report has also been published.

We have carried on a spirited correspondence with those responsible for the unpublished reports and believe that ultimately most will be published. The State Chairmen of Nevada and Utah have not been heard from after repeated letters of inquiry. The state of Vermont has reiterated its decision not to prepare a state report. We have received equivocal declarations of intent to complete the report from Montana and Texas, and it is at present uncertain whether the Arkansas report will finally be published. The following reports are scheduled for publication this fall: Arizona, California, Colorado, Illinois, Hawaii, Maine, Michigan, Minnesota, Nebraska, New Hampshire, North Dakota, Pennsylvania, Tennessee and West Virginia.

The state reports have unquestionably been a great inspiration for better services to children at state and local levels, and it is to be regretted that all the states are not willing to cooperate in the Academy project. It is hoped that they will find other ways to accomplish the same purpose.

The second major activity has consisted of the publication of previously projected reports. When Dr. Brooks resigned, he made a résumé of the seven pediatric educational conferences which should be a permanent record of this part of Academy activity. Dr. Hubbard and your Chairman have written a foreword, and the text has been re-edited and submitted to the President and President-Elect. We are now hopeful that it will be published in the near future in PEDIATRICS. This, we feel, is a real contribution to the field of medical education, and will be of great interest to members of the Academy.

You will recall that an interpretive report of the Study was solicited by the Executive Board and this has been finally redrafted and has been accepted for publication in PEDIATRICS. A second volume of the interpretive report has been planned and is still in the process of being written. Subjects for chapters were assigned as follows: Well Child Conferences, Dr. Katherine Bain; School Health Services, Dr. Thomas E. Shaffer; Mental Hygiene Services, Dr. Milton J. E. Senn; The Physically Handicapped, Dr. Samuel M. Wishik; Public Health Nursing, Dr. George M. Wheatley; Dental Health, Dr. Warren R. Sisson; Hospitals, Dr. Glidden L. Brooks; Community Organization and the Physician's Participation, Dr. Hulda E. Thelander.

Dr. Thelander has already completed her assignment and she is to be congratulated on her report. It should have great application in organizing health services on a community level. The Chairman of the ICH Committtee suggests that some provision be made by the Executive Board to complete the final interpretive report.

Respectfully submitted,
WARREN R. SISSON, *Chairman*

Dr. Sisson, in conclusion, made 3 points: "I think the premise that we have gone on in the past, and particularly during the past few months, the reasons for my becoming the interim chairman, pseudo-director, as it were, is that the Academy was committed through its activities, as sponsor of the Child Health Services and the ICH Committee, and it was my great belief, and still is my belief, that the Academy believed and still believes that these activities should be continued.

"That is the premise and certainly, if I had not accepted that interim position under that understanding, I wouldn't have accepted it, because there was nothing to do. We could have dropped it four months ago, just as well as today, because nothing would have happened then that wouldn't have happened now, if it had been decided to drop it.

"The 3 recommendations which I have are:

"First, in regard to education, I think that, as I see the new Educational Committee, I think that is a fine step, and it is a continuation of the Activities of the ICH Committee, but I don't think it goes far enough. I think that the Educational Committee has a job, and I think, outside of the Educational Committee, in a new committee or in the Advisory Committee, or some place, you ought to take up some specific problems about education which have come out from the deliberations and studies of the Educational Study and the interpretation which has been published.

I could think of many real problems which I should suggest might be considered seriously by your Advisory Committee or by some committee. I should say that one of the most important things would be how to teach the general practitioner, and I think the Academy has got to do further investigation and offer means and ways by which pediatric teaching should be disseminated to the general practitioner.

"It has been suggested that we make a report on possibly the graduate education, postgraduate education. To make a postgraduate education report is a tremendous job. It would require a full

time staff, and I don't think it falls in our area to do that. Dr. Mitchell may have something to say about that, but I think it falls in the area of a great many existing organizations at present, and they are studying postgraduate education, but we should, as an Academy, with the information that we have, make further investigations in regard, perhaps, to how best to teach pediatrics to the general practitioner who is going to be taking care of children.

"There might be others; the Advisory Committee might think there are other more important topics in the educational field, but I merely mention that as one. So, I think the investigation should be continued to put the Academy in the front-line as the leader in pediatric education.

"The second one concerns the utilization of the State Reports and the dissemination of recommendations, especially on the basis of local planning. I think there should be some way of putting succinctly recommendations for local planning. Dr. Thelander is quite competent to do that, and I think she could put that together in a very short time.

"I think the Academy ought, in its best organizations, to find some committee, whether it be a temporary committee or an Advisory Committee, to take up where I leave off, where the ICH Committee leaves off, and discuss how best to utilize and to keep on utilizing the important findings from our State Reports, in order that the membership can get full benefit of the Study.

"The final recommendation concerns the benefactors who have contributed so liberally to our work. We are indebted to them, and somebody must give an accounting as to how the money has been spent and what the Academy is going to do in the future. They all keep asking, 'What next?' I think that should be one of the important continuing activities of the Academy and of the Executive Board."

It was voted to accept the report with thanks to Dr. Sisson.

It was voted that the data of the ICH Committee be transferred to the Chairman of the Advisory Committee on Child Health.

It was voted that Dr. Sisson furnish the President of the Academy with a list of the names of the donors who supported the ICH Study with any pertinent information concerning them, and that the President write a letter of thanks and appreciation to each one of them.

Dr. John McK. Mitchell, Chairman of the Committee on Medical Education, reported as follows for that committee:

Report of the Committee on Medical Education

During the past year this Committee has been active mainly in conjunction with the regional conferences on pediatric education sponsored by the Academy through the Committee for the Improvement of Child Health.

The Chairman of the Committee has remained in close contact with the personnel of the ICH Committee in the planning and conduct of the above conferences and has attended one meeting. Other members of the Committee have been in attendance at other conferences, and most of them have been covered in this fashion.

It is the belief of the Committee that regional conferences on pediatric education should be continued, and conversations and correspondence have taken place between the Chairman and officials of the Academy looking toward the accomplishment of the same during the year 1950-51.

Under the plan being considered, it will be necessary to make members of the Committee responsible for the conduct of the conference in their region. For this reason, it will be necessary to keep in mind the geographic distribution of Committee members.

There has been some discussion of the formation of a Section on Pediatric Education in the Academy. It is hoped that this matter will receive attention at the annual meeting of the Executive Board.

Respectfully submitted,
John McK. Mitchell, *Chairman*

Dr. Mitchell further commented: "There seem to have been 2 philosophies as to what was expected of the Educational Committee, that it should be sort of an all-encompassing thing, using the term, 'Education' in its broad sense, which meant that in large measure it would take over practically everything that the ICH Committee has been trying to accomplish.

"The opposite philosophy is that it should have a certain amount of limited objectives, confining itself to education in a more commonly accepted sense of that term. I think you have settled that this morning by your decisions, which coincide with my own idea, which is that the Educational Com-

mittee should have its objective fairly well limited and defined, and restricted in its activities to those things which it may, in that sense, pretty well accomplish.

"I would like to make clear that this, what we have in mind, what we have to say now, is purely a proposal for the future, rather than a report in retrospect, because the Committee was not very active during the past year, due to the fact that its functions were very largely fulfilled by the ICH Committee.

"We have discussed the possibilities for next year at some length with Dr. Shaw and Dr. Beaven, and in general, or rather specifically, what we have planned is this: A continuation of the Regional Conferences which were held during the course of the Study, and which have been carried since by the ICH Committee. Those were conferences of purely pediatric educators, heads of the pediatric departments of their representatives, plus State Chairmen or Regional Chairmen.

"Those we plan to continue next year, as they have been done in the past, with certain minor modifications and changes which I don't think we need to go into. They are merely matters of administrative detail.

"Second, we have planned on putting out a report of these Regional Conferences, and after considerable discussion last night, the organizational meeting of this Committee having been held in advance and actually coming into being with the consent of the officers of the Academy, it was decided to include in the report of these Regional Conferences a section from each man in the Region as to what was going on in Regional graduate and postgraduate extension programs in education. That cannot possibly pretend to be a complete picture, or a complete study of what is going on in this field in the country today, because, as you know, there is a tremendous amount being done. I think we can hit some of the high spots and perhaps summarize those in a way that they will be useful.

"The third objective of the Committee this year was the consideration of the studying of the Section on Pediatric Education of the Academy. The Committee is not clear in its own thinking on that particular as yet, and it was decided last night, as far as the Committee was concerned, if that met with the approval of this Board, that they would merely start by setting up a sub-group of the Committee to study this problem and to study what would be the most effective means of bringing out to the Academy membership as a whole what is going on in education in the United States along pediatric lines today.

"I worked out with Dr. Grulee a very tentative budget, which falls within a total sum that he indicated would be available to us. That budget proposes $250 each for 10 conferences. That means the people who attend those conferences have to pay their own way.

"It carries $600 for secretarial help, in publishing reports and that sort of thing. It carries $350 for office supplies, paper and what not, and $1200 for Committee meetings, the idea being that this Committee should meet once or twice during the course of the year in order to put its own thoughts together and prepare for the preparation of reports and so on."

It was voted that the report be approved.

Dr. Mitchell then reported as Executive Secretary of the American Board of Pediatrics:

"There are 3 representatives to the American Board of Pediatrics from each of 3 organizations; the AMA, the American Pediatric Society and the American Academy of Pediatrics.

"It is a very important assignment. Unless a man happens to be interested in, and likes to undertake these examinations and have a certain amount of skill in it, he is not very useful to the Board.

"In addition to that, he has to be a man who is willing to put a lot of time and energy on it. These examinations are a grilling 3 day session. Even the toughest one who does it will tell you at the end of the time he is pretty well exhausted.

"A man has to attend a minimum of 4 meetings a year, which takes him close to 20 days, completely out of his regular life. Some men spend as many as 30 days a year at it. It is entirely gratis. They get nothing except their expenses out of it.

"At the present time, the three representatives of this Academy are: Drs. Hugh McCulloch, Lee Forrest Hill and A. Wilmot Jacobsen.

"Dr. McCulloch is due to retire and voluntarily does not wish to continue." Dr. Mitchell's report was discussed and received.

It was voted that Dr. Henry S. Poncher be appointed to succeed Dr. McCulloch as a representative of the Academy on the American Board of Pediatrics.

It was voted that Dr. Lee Forrest Hill be reappointed as a representative of the Academy on the American Board of Pediatrics.

It was voted that Dr. Mitchell be asked to transmit to the Board of Examiners the fact that it has been brought to the attention of the Academy that people who apply for examination are not being taken care of very rapidly.

It was voted that Dr. Grulee be authorized to use his desk in the Central Office after he is no longer Executive Secretary.

In view of Dr. Edward Shaw's going off the Executive Board, where he will be greatly missed, it was voted that great thanks be offered for what he had done.

It was voted that Dr. Fred Rodda be elected to Emeritus membership.

It was voted that the budget for the ICH Committee of $3,333.33 be approved, subject to the approval of the Budget Committee.

The budget for the Committee on Medical Education of $4650.00 was approved, subject to the approval of the Budget Committee.

It was voted that a letter be written to the Surgeon General of the Navy, Clifford Anders Swanson, expressing the thanks of the Academy for the interest evinced by the Navy in the pediatric project, the preparation of the film on "Embryology of Human Behavior."

It was voted that a letter be written to the Medical Film Institute of the Association of American Medical Colleges expressing the thanks of the American Academy of Pediatrics for their part in producing this same film, "The Embryology of Human Behavior."

It was voted that the Secretary, after consultation with the Editor, work out some solution which would, in effect, rebate the $10.00 to the Editorial Board.

It was voted that each Committee Chairman, when appointed, be given a list of his whole committee, and that each Committee Chairman be instructed to write to each of his committee, informing him that he is on the committee, and outlining his duties in connection with the duties of the Committee.

Most of Wednesday, Oct. 18, was spent in discussing the appointments to the various committees, which were taken up individually and passed by the Executive Board.

It was voted that the new Advisory Committee on Child Health consist of the following members: Drs. Edward B. Shaw, Chairman, Frank H. Lancaster, Joseph S. Wall, Lee Forest Hill, Edgar E. Martmer, Peter G. Danis and Warren R. Sisson.

The Editorial Board of PEDIATRICS was officially appointed by the Executive Board. The appointees of the American Board of Pediatrics were also officially designated.

Dr. Paul W. Beaven, the new President of the Academy, officially adjourned the meeting of the Executive Board at 5:45 P.M., Oct. 18, 1950.

ABSTRACT OF THE STATE CHAIRMEN'S MEETING

Chicago—Oct. 15, 1950

A joint meeting of the National Committee Chairmen, State Chairmen, Alternate District Chairmen and the Executive Board of the American Academy of Pediatrics was held in the Crystal Room of the Palmer House, Chicago. Dr. Edward B. Shaw, President, called the meeting to order at 1 P.M. and presented a short report of the actions of the Executive Board.

Dr. Edgar E. Martmer presented a simplified Treasurer's report, a copy of which was given to each State Chairman.

Dr. James G. Kramer of Ohio reported on an incident that occurred in the Ohio State meeting preliminary to the Midcentury White House Conference when someone attempted to introduce a motion proposing that crippled children's aid be administered without a means test. This was blocked in committee by lay members and never reached the floor of the meeting.

Dr. Shaw stated that the Executive Board had reaffirmed its opposition to governmental medicine at any level, without due regard for economic necessity.

Dr. Paul W. Beaven then asked each of the 70 members present to stand and introduce himself and to tell where he was from. Dr. Clifford G. Grulee was given standing applause when he introduced himself.

Dr. Beaven discussed some of the duties of the State Chairmen and then asked several State Chairmen for their comments. Dr. William W. Belford, State Chairman for Southern California, described the difficulties of operation in a state as large as California. He discussed the inadequacy of the intercommunication between the Central Office and the State Chairmen and how often the State

Chairmen knew so little of what was going on in the Academy. As a result of this, they are unable to answer questions asked of them.

The lack of continuity of purpose and thought when the State Chairmanship changes hands was also brought out.

Dr. Beaven then told how the Executive Board had decided to extend invitations to our meetings to nonmember pediatricians through the State Chairmen, for the purpose of creating good will and interest in the Academy.

Dr. Frank Van Schoick, State Chairman from Michigan, was then presented and in his talk likened the State Chairman to an ambassador without portfolio and a purveyor of good will at the state level.

Dr. Van Schoick suggested that perhaps the gap between the Executive Board and the State Chairmen could be closed by giving the State Chairmen some authority in the deliberations of the Academy, such as that given to the House of Delegates of State Medical Societies and of the AMA.

He suggested also that the term of office for State Chairmen might be for 3 years and that a State Chairmen-Elect might be created to act as a vice State Chairman and eventually succeed to the office, in such a way that he would be informed and prepared to function in his office.

Dr. Beaven thanked Dr. Van Schoick and commented that a drawback to the Academy's having an assembly was the expense. The Academy could not afford to pay the transportation of such a number of men.

Dr. James M. Baty then told of the deliberations of the committee originally charged with planning the reorganization of the Academy. The stumbling block to creating an "Assembly" was the matter of representation: about two thirds of the members of the Academy are represented by about one third of the State Chairmen. No fair and reasonable plan of representation could be worked out, so a compromise was effected and the Executive Board type of representation was proposed, whereby each District has a representative and each District has approximately the same number of fellows. The District Chairman is now elected by the fellows in that District.

Dr. Beaven pointed out that at any official meeting of State Chairmen, any motion passed can be passed on to the Executive Board and then the Business Meeting. In that sense the State Chairmen's meeting is a representative meeting.

It was also pointed out that State Chairmen can be elected for 3 years if the particular state so desires.

Dr. Harrold A. Murray, Alternate District Chairman of District III, was then introduced by Dr. Beaven. Dr. Murray discussed the manner in which the District Chairman could assist in keeping the State Chairmen informed of what the Executive Board was doing. Dr. Murray stressed the importance of the Academy's State Chairmen taking an active part in the State Medical Society and seeing to it that he or other suitable people get on the proper committees. To assist in this, a State Chapter of the Academy is of great help in that an active local organization keeps its members informed of what is happening.

Dr. Peter G. Danis, State Chairman for Missouri, then spoke on the correlation of interests in the State and National Committees, by State Chairmen. During the period of State Chairmanship the individual is being educated and introduced into the national picture of the Academy. The importance of having a State Vice-Chairman who will in some measure be prepared to succeed to the Chairmanship was also elaborated upon. Dr. Danis also brought out the importance of the Academy Committees and how the Academy actually works on a national scale through its committees. Dr. Danis then read the Report of the Committee on Hospitals and Dispensaries (see section on Committee Reports).

Dr. Beaven commented on the fact that State Chairmen are becoming the backbone of the Executive part of the Academy and that nearly all Executive Board members were formerly State Chairmen.

Dr. Beaven also announced that the Executive Board had decided to appoint Committee personnel at the June meeting of the Board, so they could have their committees well organized and hold a meeting at the time of the Academy's Annual Meeting.

Dr. Beaven then called upon Dr. Clarence Webb, the Academy's Liaison Officer to the Children's Bureau, to discuss the duties of State Chairmen. Dr. Webb felt that the State Chairman's duties fell into 3 categories:

First, his responsibility to the Academy and to the Academy members in his own state. It is his job to get new members proposed and to receive them into the Academy. He should also interpret to the members in the state the thinking and actions of the Academy.

The second duty is toward other medical men in the state. He should represent the best interests of the Academy and pediatrics but at the same time represent those interests, if possible, in the county and state organizations. Other pediatricians and general practitioners may in this way be brought nearer to the objectives of the Academy.

Thirdly, the importance of working with governmental agencies, local and state, such as the Crippled Children's agencies and the Maternal and Child Health Bureau. Also in this category should be considered the lay and semimedical agencies, such as the Tuberculosis Association and the Heart Association. Everywhere there seems to be a need for more mutual knowledge between state organizations and practicing physicians.

Dr. Warren R. Sisson, Chairman of the ICH Committee, then reported on the concluding activities of this committee. A great deal of effort had been made to stimulate the completion of the state reports; so far nearly 40 had been completed. Dr. Sisson considered the state reports the most valuable contribution of the study, as the recommendations made in the state reports are really the duties and commitments of the State Chairmen in the future.

Dr. Sisson announced that the first volume of the Interpretive Report was published in the September issue of PEDIATRICS and that the second volume would be published during the coming year.

It was voted that the Academy and the State Chairmen give Dr. Sisson a vote of thanks for winding up the work of the ICH Committee in a highly commendable manner.

The meeting adjourned at 4 P.M.

ABSTRACT OF THE ANNUAL BUSINESS MEETING

Chicago—Oct. 18, 1950

The meeting was called to order at 2 P.M. by Dr. Edward B. Shaw, President. Dr. Shaw opened the meeting by giving his Presidential Address. There was prolonged applause at termination of this Address (published in its entirety in the January 1951 issue of PEDIATRICS, volume 7, no. 1).

Secretary Grulee was then asked to give his reports. When Dr. Grulee stepped to the speakers' stand the audience rose and applauded. Both the Secretary's and Treasurer's reports (see page 814) were approved.

Dr. Grulee commented, in regard to the Treasurer's report, "The Academy at the present time is trying to get a backlog of some $95,000, so that it will stabilize us and protect us in case of serious situations; and for PEDIATRICS, one of $70,000 for the same purpose. We feel that those 2 things are necessary, and that is what we are trying to get to. We are pretty well on in getting a fund of $95,000 for the Academy office and Academy work. We are far from it for the PEDIATRICS end."

It was voted to approve the election of new members accepted by the Executive Board. Dr. Grulee made the following statement: "For fear that may be mistaken as arbitrary action I want to say that all these names have been submitted to the membership before they were acted upon; if they don't get approval, then they are usually held up by the Executive Board, so that the Executive Board takes final action after the members have given their approval."

The names of those granted Emeritus Fellowships by the Executive Board were read. No action was necessary.

The Executive Board accepted 4 resignations. These names were read.

Two members were granted a leave of absence for one year by the Executive Board. These names were read.

Secretary Grulee then reported the results of the elections in the various Districts of the Academy for District and Alternate District Chairmen:

District I—Dr. Stewart H. Clifford, Chairman
District II—Dr. William J. Orr, Alternate Chairman
District IV—Dr. Arthur H. London, Jr., Chairman
District V—Dr. Benjamin Hoyer, Alternate Chairman
District VII—Dr. Thomas J. McElhenney, Chairman
District VIII—Dr. Frank H. Douglass, Alternate Chairman

No action was required since these were the results of the member elections from the various Districts.

Secretary Grulee reported the actions of the Executive Board relative to the Editorial Board of PEDIATRICS.

Dr. Grover F. Power's resignation was accepted with regret. Dr. Harold K. Faber and Dr. Rustin McIntosh were re-elected as members of the Editorial Board. Dr. Milton Senn and Dr. Mitchell Rubin were elected to the Editorial Board.

To the American Board of Pediatrics, the Academy re-appointed Dr. Lee Forrest Hill, and Dr. Henry Poncher was appointed to fill the vacancy left by the expiration of Dr. Hugh McCulloch's term.

President Shaw asked approval of the assembly of the action of the Executive Board in granting a life pension of $5,000 yearly to Dr. Clifford Grulee, upon his retirement next July 1, 1951. It was moved, seconded and carried with applause.

Secretary Grulee announced that Mrs. Jewel Bundy had been appointed Business Manager for the Academy and that Dr. William Orr had been appointed Chairman of the Program Committee.

The final report of the Committee for Improvement of Child Health was presented by Dr. Warren R. Sisson (see section on Committee reports). At the close of his formal report, Dr. Sisson stressed the need for further investigation on how best to teach pediatrics to the general practitioner who is taking care of children; the utilization of the findings of state reports so that the members may derive full benefit from the Study; and the Academy's indebtedness to the benefactors who have contributed so liberally to the work of the Committee.

Dr. Joseph S. Wall then reported on changes in the Constitution and By-Laws made necessary by the membership mandate on re-organization, reading the changes by Section.

One proposed amendment to the Constitution was submitted to all the members, according to our Constitution, as follows:

"To promote and disseminate, through adequate public relation mechanisms, pediatric knowledge to physicians and the public in the interest of the welfare of children."

The Executive Board recommended the rejection of this proposed amendment to the Constitution and, in its place, the Board recommends it be placed in the By-Laws as:

"(j) in Section 1, Article III, and that it read, 'To maintain friendly cooperation among members of the Academy and good public relations with the medical profession and the public.' "

It was voted that the recommendation of the Executive Board be supported.

Dr. Wall then explained that the source material for the revision of the By-Laws consisted of the old By-Laws, which are largely incorporated in the revised ones, and the recommendations of the Re-organization Committee and by corresponding with the President, Vice-President and Secretary of the Academy.

Each change in the By-Laws was taken up at this meeting and the revision has been made according to vote by the members attending.

A motion was made to require the Nominating Committee to submit 2 or more candidates for the office of President-Elect. It was seconded but failed to carry, 13 voting "yes," 520 voting "no."

President Shaw called for the Report of the Nominating Committee. Dr. Dennis H. Kelly, Chairman of the Nominating Committee, "respectfully and proudly" submitted the name of Dr. Warren W. Quillian of Miami, Fla., as the nominee for President-Elect.

It was voted that the nominations be closed and that Dr. Quillian be elected by acclamation.

Dr. Quillian was called to the platform and made the following remarks: "Mr. President, it is with a deep sense of humility and appreciation that I accept this nomination. You have pointed out this afternoon that this is a time of crisis. I have been told that the Chinese language has a word for crisis, which includes the derivation of two terms, meaning peril. We certainly have an arduous task in front of us the next two years.

"Having had the privilege of serving with many of the members of the present Board, and in a way with other members of the organization, I am not worried particularly about the challenge. I feel that the Academy represents the outstanding force in America today for the improvement of child health, and that there are many other organizations interested in child health who are looking to this group for leadership. That brings a responsibility to each one of us individually, and in the acceptance of this nomination for which I am very grateful to the Nominating Committee, to the Executive Board, and to this assembly, I believe that working in unison, we can solve many of the problems with mutual help.

"This is no time for a speech, but that is from the heart."

President Shaw then introduced Dr. Einor H. Christopherson, who is to be the new Executive Secretary.

Secretary Grulee then presented the following resolutions which were approved:

"*Be It Resolved,* That the American Academy of Pediatrics expresses its sincere appreciation to the local members in the Chicago area, Drs. John L. Reichert and George F. Munns, Co-Chairmen of the Local Committee, and members of the Chicago area for their splendid cooperation in the planning and conduct of the Annual Meeting held at the Palmer House, Oct. 16 to 19, 1950.

"*Be It Also Resolved,* That the American Academy of Pediatrics expresses its sincere appreciation to Dr. Tom Mitchell and Dr. Ralph Spaeth, for their untiring efforts in arranging the Scientific Exhibits of this meeting.

"*Be It Resolved,* That the American Academy of Pediatrics expresses its appreciation to the management of the Palmer House for the cooperation of executives as well as employees and especially Mr. Richard L. Collison, General Sales Manager, and Mr. George Jonnes, Catering Manager, during the period of the Annual Meeting held Oct. 14 to 19, 1950.

"*Be It Resolved,* That the American Academy of Pediatrics expresses its sincere appreciation to the Chicago Convention Bureau for their assistance during this meeting.

"*Be It Resolved,* That the American Academy of Pediatrics expresses its sincere appreciation to the Ladies' Committee—Mrs. Eugene T. McEnery, Mrs. George F. Munns, Mrs. John L. Reichert, and the wives of the Chicago area members for their fine cooperation.

"*Be It Resolved,* That the American Academy of Pediatrics sincerely appreciates the courtesy of the Armour Laboratories; Beech-Nut Packing Company; Borden Company; the Carnation Company; Gerber Products Company; Libby, McNeill & Libby; Mead Johnson & Company; M & R Dietetic Laboratories, Inc.; and Pet Milk Sales Corporation; in providing the special events for members and their wives attending this meeting."

Dr. Meldrum K. Wylder of New Mexico addressed the President and moved the following resolution be adopted:

"*Be It Resolved,* By those here present, that the thanks of this Academy are due to Dr. Edgar Martmer for the long, faithful, and at all times efficient service that he has rendered, both in and out of season, and that it is with deep regret that we see him leave this position. It is gratifying, however, to know that he will continue to serve the Academy as the Director of an important committee."

Secretary Grulee read another resolution: "*Be it resolved* that the American Academy of Pediatrics commends the Bureau of Medicine and Surgery of the United States Navy for their interest in child care, as expressed by their cooperation with the Medical Film Institute in the preparation of the film, 'The Embryology of Human Behavior.' "

Dr. Harvey Garrison made the following motion which was seconded and passed: "Inasmuch as the American Academy of Pediatrics is dedicated to the promotion of the well-being of children, and insofar as the aims and purposes of the Midcentury White House Conference coincide with those of the Academy, the Academy recommends that its members assist and cooperate in the studies being conducted by the Conference."

There being no further business, Dr. Shaw, after calling upon Dr. Paul Beaven to come forward, made the following statement:

"It is my very happy privilege to turn over this office to a most able successor. It has been a delight to work with Paul Beaven this last year. He cannot possibly work any harder next year than he has worked this year. The job of the presidency has become one of team effort, and I could not ask for a better team mate for anybody than Paul Beaven has been. He will do it in a way that will leave me most envious, I am sure. I am happy that he is to have an excellent team mate as well.

"So I turn over the presidency of this organization to the safest hands I know, Paul Beaven's."

The audience rose and applauded, and Dr. Paul Beaven assumed the chair.

President Beaven made the following address: "Dr. Shaw. During my year as President-Elect, I have had the feeling of experience. As you know, I wrote a letter once, addressed to all members of the Academy, which was published in the News Letter, asking the advice of all the membership as to who should be put on every committee.

"You probably will be amazed, as I was, at the literally hundreds of members who were recommended for committees. Not only did the large group recommend others, but there were numerous

members who desired to serve on one or the other committees, and applied for some assignment. I tried to evaluate the recommendations of the members who wrote in. I do not recommend members for these committees, except provisionally. The Board assumes the entire responsibility for those who are chosen.

"I think it would be appropriate also to say that, while I have had letters from the officers and state chairmen and committee heads, I have also had letters from men who have never had any office in the Academy, and some of them have been exceedingly helpful. Not only were there letters concerned with the committee personnel, but they contained ideas which I felt would be of benefit and help to our organization, and I have passed these on to the Board for their benefit.

"Since I am to be President for the coming year, I think it is proper for me to state what I think are the most important accomplishments for which we should strive.

"First of all, the Academy should have as its aim the greatest help to the greatest number of members. It should become an indispensable organization for any pediatrician.

"Second, we should strive toward creating a feeling of good will among our members.

"Last, and most important, we should continue to enhance that leadership in all phases of child health and child well being.

"How can we be of help to most members? The democratic process that has been going on during the last few years can be continued and augmented.

"May I call your attention to the fact that we now publish a News Letter which, from my observation, is widely read. This News Letter will continue. We have had a re-organization plan that was approved not only at the annual meeting, but the deciding vote was by a mail vote of all members. The whole membership was asked to help in the appointment of committee personnel.

"This is the type of procedure which I think should continue, and this year a definite policy will be followed by the Board of placing many new members on committees. Except in definitely indicated places, no names will be used twice.

"How can we create a feeling of good will among our members? You can realize that there are, within our society, practitioners, men and women engaged wholly in teaching, and public health positions. Our leadership should come from all 3. There are a large group of us who are engaged in either 2 or 3 of these, and not in one field alone. This is not an organization that is made up just of practitioners, nor is it one that should be entirely run by those who are in academic work, nor those in the public health capacity. These three are interdependent, and I want you to know that I feel strongly on this. There must be the utmost cooperation. I want you also to know that members of the Executive Board feel similarly.

"How can we continue to enhance our leadership in child health work? We attained such leadership through child health, first, because we were a major pediatric organization; secondly, because of the work of our committees; and third, because of the survey.

"Let us now enhance our leadership through our re-organization. We cannot go back to the society which existed only for pediatric programs. It is written in our Constitution that we are founded for the promotion of all aspects of child welfare, and it is for that object that we will continually strive.

"Dr. Grulee steps down during the middle of my administration, and Dr. Christopherson takes his place. It is obvious that every member of the Academy should do his utmost to help the new Executive Secretary and, to a certain extent, he holds our destiny in his hands.

"You are going to admire him. You are going to trust him. I don't need any more assurance than I have already received that you will give me your help, for it has come from many, many members. It is my hope that during the coming year, I shall be able to profit by the valuable help that has been given me as President-Elect by both Dr. Shaw and Dr. Grulee. It is my hope that with the continued advice of Dr. Grulee, and later of Dr. Christopherson, the Executive Board and other officers of the Academy, that we shall continue toward that goal and extend the influence of our Academy."

The meeting adjourned at 4 o'clock.

ADDRESS CHANGES OF MEMBERS OF THE ACADEMY

Dr. W. B. Adams
Owls Head, Maine

Dr. Marion L. Ainsworth
350 E. Broad St.
Columbus, Ohio

Dr. John R. Ashe
1505 Elizabeth Ave.
Charlotte, N.C.

Dr. Harry Baker
2186 W. Broadway
Vancouver, B.C., Canada

Dr. William J. Ball
63A S. Broadway
Aurora, Ill.

Dr. Felipe Cacho (Affiliate)
Angel Urraza No. 931
Col del Valle
México, D. F.

Dr. Hester B. Curtis
State Health Dept.
436 Capitol Ave.
Hartford, Conn.

Dr. Florencio Escardó
Teodoro Garcia 1890
Buenos Aires

Dr. Harriet M. Felton
Dept. of Pediatrics
Medical Branch
University of Texas
Galveston, Tex.

Dr. Carlos Ferrufino
c/o Mr. James E. McCall
United Nations Bldg.
Padre Faura St.
Ermita, Manila, P.I.

Dr. I. Elizabeth Fletcher
1945 Sylvan Circle, S.W., Apt. B-1
Atlanta, Ga.

Dr. Charles Houston Gay
1012 Kings Dr.
Charlotte, N.C.

Dr. Bernard German
2 Shanley Ave.
Newark, N.J.

Dr. John Giblin
1138 Elm St.
Manchester, N.H.

Dr. Samuel Goldberg (Emeritus)
Park Drive Manor, Apt. 524
Harvey St. and Lincoln Dr.
Philadelphia

Dr. Jesús Gómez Pagola
Monterrey #101
México, D. F.

Dr. Clifford G. Grulee, Jr.
Dept. of Pediatrics
Tulane University Medical School
New Orleans

Dr. Martin H. Jacobs
89-34 Van Wyck Expressway
Jamaica, L.I., N.Y.

Dr. Dorothy S. Jaeger-Lee
1303 Highland Dr.
Silver Spring, Md.

Dr. George Kahn
1755 Beacon St.
Brookline, Mass.

Dr. Max Kaplan
20 Timber Lane
Northbrook, Ill.

Dr. Hilda Knobloch
15 W. Mt. Vernon Pl.
Baltimore

Dr. Steven Ellis Koweity
Modiin St., Corner Hivat Zion
Ramat-Gan, Israel

Dr. Bennett Joseph LaCour, Jr.
701 N. Peninsula Dr.
Daytona Beach, Fla.

Dr. Manuel M. Lander
Cornell Towers, Apt. 1008
5346 S. Cornell Ave.
Chicago

Dr. Leo Litter
44 Garden St.
Hartford, Conn.

Dr. Ramon Fernandez Marchante
Tapio #12, Ocean Park
Santurce, Puerto Rico

Dr. Ann L. Martin (Emeritus)
2700 Mountain Blvd.
Oakland, Calif.

Dr. Edith M. Meyers
2021 Alameda Ave.
Alameda, Calif.

Dr. Louise W. Rauh
987 Marian Ave.
Cincinnati

Dr. Ray D. Schirack
15850 E. Warren Ave.
Detroit

Dr. Leslie Nelles Silverthorne
555 University Ave.
Toronto, Canada

Dr. Spencer Snow
Brigham Street Medical Bldg.
Suite 211-213
465 E. South Temple
Salt Lake City, Utah

Dr. George E. Stafford
1021 Sharp Bldg.
Lincoln, Neb.

Dr. Albert F. Stein
1801 Seward St.
Evanston, Ill.

Dr. George Edward Weick
218 N. First St.
Boise, Idaho

Dr. Samuel J. Werlin
42 Second St.
Troy, N.Y.

Dr. Morton Zall
6317 Wilshire Blvd.
Los Angeles

The following members of the Academy have died recently:

Dr. John C. Danahy
Board of Education
216 E. 9th St.
Cincinnati
(Died Nov. 7, 1950)

Dr. Robert H. Graham
63-A S. Broadway
Aurora, Ill.
(Died March 20, 1951)

Dr. Guy L. Hacker
3600 Colgate
Dallas
(Died Jan. 22, 1951)

Dr. Paul M. Hamilton
1635 Chelsea Rd.
San Marino, Calif.
(Died April 9, 1951)

Dr. Lawrence R. Jacobus
2940 Summit St.
Oakland, Calif.
(Died Dec. 31, 1950)

Dr. J. M. Lewis
25 E. 83rd St.
New York City
(Died Jan. 26, 1951)

Dr. Frederick H. Maurer
331 Fulton St.
Peoria, Ill.
(Died April 22, 1951)

Dr. Leonard G. Parsons
58 Calthorpe Rd., Edgbaston
Birmingham, England
HONORARY MEMBER
(Died Dec. 17, 1950)

Dr. Harvey O. Rohrbach
R. D. 1
Danielsville, Pa.
EMERITUS MEMBER
(Died Feb. 9, 1951)

Dr. John Phillips Stout
Fair Haven, N.J.
EMERITUS MEMBER
(Died Nov. 21, 1950)

BCG VACCINE

A Symposium

PAUL W. BEAVEN, M.D., *Chairman*

PREVENTION OF TUBERCULOSIS AMONG CHILDREN WITHOUT THE USE OF BCG

(Presented as an Original Article on page 793 of this issue)

J. ARTHUR MYERS, M.D.
University of Minnesota Medical School, Minneapolis

DEFICIENCIES IN OUR KNOWLEDGE OF BCG VACCINE

MILTON I. LEVINE, M.D.
New York City Health Department, New York City

STANDARDIZATION AND FUTURE OF BCG VACCINE

SOL ROY ROSENTHAL, M.D.
Institution for Tuberculosis Research, University of Illinois; Research Foundation; Chicago Municipal Tuberculosis Sanitarium

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BCG VACCINATION

ROBERT J. G. ANDERSON, M.D.
Division of Tuberculosis, U. S. Public Health Service, Washington, D.C.

Presented at the Annual Meeting of the American Academy of Pediatrics, Chicago, Oct. 16, 1950

INTRODUCTION

PAUL W. BEAVEN, M.D.

It is evident that the time has arrived when pediatricians in this country should have expert advice on the use of BCG in the control of tuberculosis in children. Other parts of the world are now confronted with an increase in this disease. They are establishing programs to resis' this infection, and their respect for the value of BCG is attested to by the fact that its use forms a major part of such programs. Physicians returning to America from these countries are advising us to accept this additional technic in our attempt to eradicate tuberculosis.

This symposium is the result of many requests from our members. In order to obtain divergent viewpoints, four speakers have been chosen whose opinions each of us respects but who have come to different conclusions.

Dr. J. A. Myers is the first speaker. He has spent his professional life in combatting tuberculosis in children and young adults. Following him, Dr. Sol Roy Rosenthal will speak. He is Director of the Tice Laboratories affiliated with the University of Illinois. This institution is one of the main distributors of BCG in this country. The next speaker is Dr. Milton Levine, Chief Consultant on BCG vaccination to the New York State Health Department. The concluding paper on the symposium will be given by Dr. Robert Anderson, Chief Medical Director, Division of Tuberculosis, of the U. S. Public Health Service.

DEFICIENCIES IN OUR KNOWLEDGE OF BCG VACCINE

MILTON I. LEVINE, M.D.

Although there is today almost unanimous acceptance of the opinion that BCG vaccine is entirely harmless and that it confers a partial immunity against tuberculosis, considerable further knowledge is needed before this vaccine can be accepted for general use.

At the present time no method has been developed for stabilizing the potency of the vaccine. No means has been developed to assure that similar amounts of BCG from different laboratories would have equal numbers of viable organisms and equal potency. There is no knowledge of the actual degree of immunity conferred by the vaccine on the duration of this immunity. There is no agreement on the optimal dosage to be given or the best method of administering the vaccine.

Studies by Dr. Renee Dubos, of the Rockefeller Institute, demonstrated a loss of as many as 90% of viable organisms in the first 2 hours if the vaccine is not kept under constant refrigeration. Attempts at adequately stabilizing the potency of the fresh vaccine by lyophilization have so far been unsuccessful, cultures showing a marked decrease in the number of viable organisms immediately after preparation. However, Birkhaug has shown that the number of living elements remaining in the vaccine after drying or freezing continue unchanged for more than a year under proper conditions.

The marked variation in the potency of the same amount of vaccine from different laboratories is also open to further investigation.

Suter and Dubos, inoculating into the skin of guinea pigs a specified amount of BCG vaccine from each of 3 laboratories, found a specific difference between each vaccine not only in the size of the local lesion, but in the persistence of the lesions as well. Moreover, the cultural characteristics of the three strains varied greatly, as did their susceptibility to inhibitory substances.

Sheffer, using BCG vaccine from 5 different sources, found that the local lesions caused by the individual vaccines differed markedly even when the same number of living bacilli were inoculated.

The question is frequently asked why BCG has not been adopted for general use in the United States since it has been used so widely elsewhere. The answer is clear. In the United States, antituberculous measures such as case detection, separation of contacts, hospitalization, mass x-ray studies, removal of tuberculin-positive cows and pasturization, have achieved a success surpassing that of countries where BCG has been used.

In New York City, the tuberculosis mortality for the group up to 15 years of age has dropped over 95% since 1915.

It would appear that BCG vaccine can in no way be offered as a substitute for other antituberculous methods so successfully used in the country. At best it may be offered as a supplement to already existing control methods.

Until the necessary knowledge concerning BCG is obtained, it should not be licensed in the United States for production by commercial laboratories, and its use should be continued on an experimental basis, limiting it to the inoculation of individuals where tuberculosis exposure is likely to occur, and also in selected population areas with high tuberculosis mortality rates.

STANDARDIZATION AND FUTURE OF BCG VACCINE

SOL ROY ROSENTHAL, M.D.

On July 7, 1950, the Federal Security Agency licensed the BCG Laboratory of the University of Illinois and Research Foundation to produce, sell and distribute BCG vaccine. This implies, in the opinion of the United States Government, that the vaccine is safe for human inoculation. Since 50 million persons have thus far been vaccinated with BCG and in some countries it is mandatory to be vaccinated, the safety of BCG is unequivocable.

For the past 16 years the vaccine has given consistent results in the following method of standardization:

1. Viability
2. Conversion of tuberculin reaction in animal and man
3. Immunity in animal and man
4. Avirulence for animal and man
5. Morphology
6. Sterility

These consistent results indicate that the vaccine is well standardized and consistent in the results it produces.

In some 3,418 children vaccinated at birth, half of whom were controls, there was a 71% decrease in morbidity and 83% decrease in mortality, as compared with the controls. In children vaccinated in a Federal Housing Project (all Negro), where the open cases of tuberculosis were removed, there has not been a single case of tuberculosis in 8 years of study among the vaccinated (745 children). In 1,086 controls, there were 9 cases of tuberculosis, which included 2 deaths. No tuberculosis developed in a group of 1,622 children vaccinated in orphanages and followed for 6 years. In 987 controls, there were 4 cases of tuberculosis during the same period. These results indicate that using the accepted methods of tuberculosis control, such as mass x-ray, isolation of the active case, and improvement of social conditions, plus BCG vaccination, the possibility of eliminating tuberculosis completely is great.

A new method has been developed for the production of a vaccine which is stable for periods up to one year. The conversions in both animal and man have compared very well with the freshly prepared material, and experimentally in animals immunity produced is equal to that produced by the fresh vaccine.

BCG VACCINATION

ROBERT J. G. ANDERSON, M.D.

BCG vaccination for all children is a widespread practice in some countries, and it is justified where tuberculosis morbidity and mortality rates are high and where many shortages make usual methods of tuberculosis control impossible. But in the United States, most children are not constantly threatened with tuberculosis as they are in other countries, and as long as the efficacy of BCG is subject to many questions, its use as a part of the pediatrician's routine of preventive measures is not indicated. BCG vaccination of children, furthermore, would contribute little to total tuberculosis control at present, because tuberculosis prevalence and mortality are low among children, and much higher in older age groups. In 1948, only 3.7% of the tuberculosis deaths in the United States occurred among children under 15, whereas 54.9% were among persons of 45 years and over. There will be circumstances, however, where physicians, concerned about children under their care who are exposed to the risk of infection, may want to consider giving BCG.

From the evidence which has been reported about BCG, it appears that the vaccine gives some resistance to tuberculosis to most of the people who are vaccinated with it, but the degree of that

resistance and how long it lasts are matters on which we have little information. In time, careful observation of tuberculosis morbidity and mortality in terms of BCG vaccinations performed will give us knowledge about the vaccine's effectiveness. Continued studies in the laboratory and the field will ultimately clear up the unanswered questions about standardization of the product, the duration of its potency, about dosage, technics of vaccinating, and criteria for determining tuberculin conversions. In the meantime, however, the private physician and the public health officer must decide how BCG is to be used now, while there are still many uncertainties about it.

Experts are agreed that mass application of BCG would not be wise in this country, but that vaccination here should be limited to persons who by occupation or situation are exposed continually to tuberculosis. Whatever protection BCG offers should perhaps be given to physicians, nurses, laboratory workers and hospital employees, whose work implies a certain risk of infection, and to the patients, inmates and employees of institutions such as mental hospitals and prisons, where the incidence of tuberculosis is known to be high.

In any use that is made of BCG, the interests of all concerned can be served best through plans worked out mutually by physicians and public health authorities. Pediatricians, who are accustomed to working with health departments in the practice of preventive medicine, will have an established pattern for such cooperative planning.

Many health departments will want to set up rosters of persons vaccinated with BCG. Such a list should be readily available to the physician, so that he can check against it the results of his patients' tuberculin tests, since the test is an important tool in differential diagnosis.

In many communities, the practical arrangement will be the sponsorship of BCG vaccination clinics by the health department. Because the life of the organisms in BCG is a matter of days, administration of the vaccine presents exceptional difficulties to the private practitioner. The health department, however, can have routine procedures for obtaining BCG and administering it under the necessary conditions. Arrangements should be made to have these facilities available to physicians so that they could refer to the clinic those patients for whom they recommend BCG vaccination.

BCG obviously cannot replace other methods of tuberculosis control, but must be considered as one part of a total program. For the present, therefore, indiscriminate BCG vaccination of children in this country has no place in the physician's armamentarium. Sound clinical judgment must determine the choice of those to be vaccinated.

Round Table Discussion

RECENT ADVANCES IN THE TREATMENT OF BLOOD DYSCRASIAS IN CHILDREN

MILA PIERCE, M.D., Chicago, *Chairman;* I. DAVIDSOHN, M.D., Chicago; EDITH POTTER, M.D., Chicago

WILLIAM J. SCOTT, M.D., Grosse Pointe, Mich., and JAMES B. SNOW, M.D., Oklahoma City, *Secretaries*

Chairman Pierce: I wish to emphasize that your participation in the discussion is cordially invited. It is the desire of the Program Committee that the Round Table provide an opportunity for all of us to share our experience. The specialists whom we have invited to join us and who are well known to us have kindly indicated their willingness to take part in the discussion. Dr. I. Davidsohn is the attending hematologist at Mt. Sinai Hospital; Dr. Edith Potter is the pathologist at Chicago Lying-in Hospital. The subject for discussion this morning will be limited to a discussion of acute hemolytic anemia of the newborn, or erythroblastosis fetalis—hematologic and pathologic aspects of the disease. All the hemolytic anemias have certain common characteristics. Erythrocytes are destroyed, anemia follows, hepatic function is disturbed by anoxia, and further impaired by the demand for the excretion of excessive quantities of blood pigment. Bilirubinemia follows. The hematopoietic centers compensate for blood destruction by delivery of reticulated erythrocytes or normoblasts to the blood and extramedullary erythropoiesis may result. In the acute hemolytic anemias this chain of events is initiated by a plasma factor while the cells themselves are normal. The plasma factor may be (1) an antibody; (2) a toxin of bacterial or spirochetal origin; (3) a chemical, or (4) a hormone. In the chronic types of hemolytic anemias there is often a familial or racial abnormality of the erythrocytes which predisposes it to the hemolytic effects of a plasma factor. Examples of hemolytic anemia resulting from these various causes are seen in the newborn. (1) Erythroblastosis fetalis or hemolytic disease of the newborn is due to the antigen antibody reaction caused by incompatibility of blood groups of mother and baby; (2) hemolytic anemia due to bacterial toxin may result from sepsis, bronchopneumonia or congenital lues; (3) in congenital hemolytic icterus, the splenic or hormonal factor together with erythrocytes which are spheroids rather than discs in the cause of the anemia. It is generally conceded that the entity known as erythroblastosis fetalis or hemolytic disease of the newborn is due to an isoimmunization of the infant to the Rh or A B blood factor and that other causes can be excluded. The choice of a name for the entity has been difficult since neither erythroblastosis nor hemolytic anemia per se are pathognomonic of the particular entity in question. The acceptance of the term hemolytic disease of the newborn in preference to erythroblastosis fetalis recognizes the storm of protest against the implication that the presence of erythroblasts or normoblasts in the blood, and even the pathologic findings of extramedullary myelopoiesis in the newborn, was limited to a single entity. The term hemolytic disease of the newborn emphasizes one of the cardinal criteria for the diagnosis of the disease; that is, a proof of a hemolytic process by a demonstrable elevation in the blood bilirubin and an increased amount of iron deposited in the liver. Even this term may require revision since it is doubtful that the gravest manifestations of the disease, notably kernicterus and hydrops, are caused by the hemolytic process per se. The pathogenesis of kernicterus and hydrops is unknown. There is some evidence to support the theory that these manifestations are caused by liver damage which results in degenerative changes in the nervous system, and that hypoproteinemia causes edema of hydrops. However, further pathologic evidence is necessary to establish this theory. In the past 10 years serologic proof of isoimmunization in babies showing the disease has been demonstrated in an increasingly high percentage of cases, but proof that a quantitative relationship exists between the amount of circulating antibodies in the blood of the infant and the severity of the disease is more elusive. For instance, there is little proof that the titer of circulating antibodies is higher in babies

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showing kernicterus than in those mildly affected. It is possible that the discrepancy between the demonstrable antibodies and the severity of the disease is a qualitative rather than a quantitative matter depending upon differences in the type of antibodies produced.

The clinician is chiefly concerned with his responsibility in the management of an affected child. The evaluation as his responsibility will take him full circle round the entire problem. It should begin with the knowledge of the reproductive history of the mother, noting the factors which would account for an isoimmunization, a previous blood transfusion, or an abortion, and the demonstration of the presence of antibodies in the mother's blood during the current pregnancy. At the time of birth, the diagnosis must be made, the severity of the disease classified, and a choice of treatment determined. The criteria for diagnosis in the infant may be listed as follows:

1. Jaundice developing within the first few hours
2. An anemia of 13 gm. or less in the cord blood
3. Erythroblastemia, 25 or more nucleated reds/100 WBC's
4. Splenomegaly and hepatomegaly
5. Serologic evidence of a sensitized infant cell by means of the Coombs' test
6. A history of maternal sensitization
7. An elevated icteric index in the cord blood

The severity of the disease may then be classified as follows:

1. No disease, with a demonstrable incompatibility in the blood of mother and child
2. Mild disease, in which the cord hemoglobin is more than 13 gm. with mild erythroblastemia and mild jaundice
3. Moderate disease, with a cord hemoglobin between 11 and 13 gm., severe erythroblastemia and deep jaundice
4. Severe disease with a cord hemoglobin of less than 11 or 12 gm., severe jaundice, and/or signs of central nervous system impairment

A full evaluation of the choice of treatment will depend upon the accumulated data in which there are many variables collected from large newborn services or a children's hospital where large numbers of these infants are referred. Statistical reports from these centers, indicating that one form of treatment is preferable to another, must be analyzed in terms of the clinical data presented. Recent reviews have stressed the fact that the disease in its mild form is being treated earlier, and that the mortality statistics are being affected favorably by inclusion of these cases where no disease is demonstrable.

The clinician must decide whether he will elect to use an exchange transfusion in preference to small repeated transfusions in the treatment of this disease and he must decide what type of blood is to be used. Until last year argument for and against various types of transfusions left no overwhelming enthusiasm for any particular one. Recent reports which indicate that exchange transfusions with female blood most favorably effect the gravest manifestations of the disease (notably kernicterus) is a strong argument in favor of this type of treatment. However, it is fair to say that further observations are necessary to evaluate the results of therapy with female blood and of exchange transfusions before it can be said to be the best form of therapy. Further discussion on this point will follow.

After this brief introduction, I suggest that we now open the discussion with a consideration of the serologic detection of the isoimmunization phenomenon and I will ask Dr. Davidsohn to make some remarks at this time.

Dr. I. Davidsohn: There are 3 clinically significant and distinct systems of blood factors in human red cells:

1. Factors ABO, with natural antibodies against factors A and B. They form the basis of the division of human blood into the 4 main blood groups, which are the basis for the selection of donors for blood transfusions.

2. Factors M and N. There are no natural and no immune antibodies against these factors. Therefore, they have no clinical significance.

3. Factor Rh. There are several types of the Rh factor. The most important is Rh_o or D factor, and the Rh-negative factor. The former is the strongest antigen of the Rh types, and therefore clinically the most significant.

A person may become sensitized to Rh blood if he lacks that particular Rh type and receives a transfusion with blood containing it. In the case of a woman, the same effect may be achieved by pregnancy with a fetus possessing the Rh type which the woman lacks. Sensitization to the Rh factor is apparently a life-long process.

The practical application to transfusions is that only Rh homologous blood be used, especially in women, because in their case, in addition to the other hazards, sensitization to the Rh factor may result in having even the first baby affected with the disease, otherwise a rare occurrence.

Over 95% of cases of fetal erythroblastosis are due to Rh incompatibility between mother and child.

Pathogenesis of fetal erythroblastosis:

Rh antibodies in the mother as a result of the entrance of Rh-positive blood or of its components through the placenta from the fetus into her circulation and the passage of such antibodies back from the mother through the placenta into the fetus, with consequent damage to the fetal blood, anoxia, damage to the liver, to the brain, etc. All manifestations and pathologic changes can be explained in this way. The discrepancy between the possibility of fetal erythroblastosis in 10% of all births and the actual occurrence only once in from 200 to 300 deliveries is explained by the fact that it takes as a rule more than one pregnancy for sufficient sensitization to develop. This is caused by differences in the development of antibodies in various individuals, in the antigenicity of the blood, and in the permeability of the placenta.

Fetal erythroblastosis due to Rh incompatibility is also possible in children of Rh-positive mothers and is caused by the differences in the types of the Rh factor.

The serologic diagnosis of fetal erythroblastosis can be divided into prenatal and postnatal.

1. Prenatal diagnosis. Husband and wife must be different with regard to the Rh factor. From serologic Rh type difference, no conclusions must be drawn as to Rh incompatibility. The latter means finding evidence of Rh sensitization by the presence of antibodies. The presence of sensitization in the course of pregnancy does not necessarily mean that it is due to the current pregnancy. For that purpose, one can utilize the finding that the antibodies develop as a rule after the third month of pregnancy. If antibodies are present during the first trimester they are usually due to preceding pregnancies or transfusions, and are known as carry-over antibodies.

The study of antibodies during pregnancy includes the examination of the serum of the pregnant woman: (a) for saline agglutinins, (b) for serum albumin agglutinins using human serum or bovine albumin diluents and (c) for blocking antibodies. Other recent developments include the Coombs' test and enzymatic substances, especially trypsin, for making the red cells more susceptible to the action of antibodies. With the help of these tests, Rh sensitization can be detected in close to 100% of cases.

2. Postnatal diagnosis of erythroblastosis, which is usually made with the help of clinical findings and, in the case of an autopsy, of postmortem findings, can be supported by the serologic studies of the blood of the parents and of the infant.

In cases of so-called latent disease, in which there may be no manifestations during the first day or two and severe manifestations following it, diagnosis can be made during the latent period by doing a blood count and hemoglobin on the cord blood, by testing the cord blood for the Rh factor, and by doing a Coombs' test on it. If the red count on the cord blood shows a hemoglobin value of 14 gm. or less, RBC count of 4.5 million/cmm. or less, a positive Rh and Coombs' test, then the diagnosis of latent fetal erythroblastosis is justified.

Serologic studies can also be of value in so-called late fetal erythroblastosis when anemia is first detected in children several months old and in cases of late kernicterus.

Prognostic Value of Serologic Tests

Study of the husband's blood for homo- and heterozygosity is important. If he is found Rh_o homozygous then all his children will be Rh_o-positive and, therefore, there is greater probability of disease. In the first born child the prognosis is excellent except if there is a history of a previous blood transfusion, especially if it is known that the transfusion was given with Rh-positive blood. Abortions, stillborn babies and twins have an aggravating prognostic significance.

Also the nature of the antibodies is important. Saline agglutinins give a much better prognosis than serum albumin agglutinins. Blocking antibodies have a serious prognostic significance. Therefore, it is important to test the blood of the mother for all the 3 varieties of antibodies.

Another factor is the time when the antibodies are found. For reasons mentioned, the finding of antibodies during the first trimester changes the interpretation. The finding of antibodies the first time 4 weeks before term or later permits a good prognosis. Relatively good is the prognosis also when the antibodies are first found 8 weeks before term or later. Much more serious is the prognosis when the antibodies are found as early as the fifth month.

The titer of the antibodies may also be significant. The prognosis is worse as a rule if the titer is elevated on repeated tests. This rule does not hold in every case.

Serologic aspects of treatment:

Only Rh-negative blood should be given in spite of the fact that the infants are Rh-positive. Amount to be given: 10 cc./lb. body weight. Recently good experiences have been reported with Rh-negative resuspended blood cells. The removal of plasma lessens the tendency towards undesirable reactions, which have been attributed to the presence in adult plasma of a factor necessary for agglutination which is normally absent in the plasma of the newborn.

Exchange transfusions have been recommended. The most recent modification of exchange transfusions is (1) giving 120 cc. of packed Rh-negative red blood cells without the plasma and (2) removal of 120 cc. of infant's whole blood.

Indications for blood transfusions: (1) Clinical evidence of the disease. (2) Latent erythroblastosis, confirmed by the finding of the previously mentioned 4 criteria. A bad obstetric history with regard to erythroblastosis justifies, according to some, exchange transfusions even in latent erythroblastosis. In the absence of a bad obstetric history with regard to erythroblastosis, single transfusions are recommended.

Prevention of fetal erythroblastosis:

Most important is giving only Rh homologous blood to women regardless of age. Intramuscular injections of Rh-positive blood have been implicated, especially in some individuals who are particularly sensitive to heterologous antigens and who respond with sensitization even following injections of small amounts of blood. A few cases seem to have been actually observed.

Hapten is a substance capable of combining with antibodies without being able to produce them. However, it has not been shown that the recently reported Rh hapten is a substance deserving that name. Clinical application does not seem to be justified by available evidence.

Erythroblastosis may be caused by AB incompatibility. It seems to be as a rule milder than the disease caused by Rh incompatibility. The treatment is the same except that blood of group O should be used for transfusion.

Summary:

1. Homologous Rh blood should be used for transfusions of women regardless of age.

2. The presence of fetal erythroblastosis in a newborn baby is an indication for the transfusion of Rh-negative blood in one of several ways that have been described.

3. Much information of diagnostic and prognostic significance may be obtained by examination of the blood during pregnancy. In such a case, all 3 varieties of antibodies should be examined, and the test should be done repeatedly, the first time during the first trimester.

4. The examination of the husband's blood for homo- and heterozygosity may be valuable prognostically.

5. If erythroblastosis caused by AB factors is suspected the infant should be given blood of group O and not homologous blood.

Chairman Pierce: If there are no questions, I will call on Dr. Edith Potter.

Dr. Potter: It is especially important to establish the existence or absence of erythroblastosis in any infant in whom the possibility of the disease exists because of its importance in relation to the outlook for future pregnancies in the mother. Too many Rh-negative women who have lost infants from causes totally unrelated to erythroblastosis have been needlessly warned against future pregnancies. Unless definite evidence of erythroblastosis exists there is no more reason an Rh-negative woman should not attempt further pregnancies than an Rh-positive woman. If definite evidence of erythroblastosis does exist, no woman should be permitted to attempt further pregnancies without knowing the great probability that exists for a repetition of the disease, often in progressively more severe forms, in subsequent pregnancies.

It is sometimes difficult in either a living or dead child to definitely establish a diagnosis of this disease. The two most important criteria, without which a diagnosis cannot be made, are evidence of anemia in the infant and isoimmunization in the mother. The clinical and pathologic characteristics of the disease are secondary to the destruction of red blood cells caused by the action of isoantibodies. The Rh factor is usually responsible for the maternal immunization. The most usual evidence of red cell destruction in the infant is the existence of extramedullary erythropoiesis, the distribution and degree of cell formation being dependent on the time at which antibodies begin to affect the fetus and the extent of their action. Immature cells in extramedullary areas seem to escape into the circulation more readily than those in the bone marrow and as a consequence the number of im-

mature red blood cells in the circulating blood is an index to the amount of extramedullary erythropoiesis. Soon after birth erythropoiesis in areas other than the bone marrow ceases and simultaneously immature cells disappear from the circulation even through erythrocytes are still being destroyed and the need is even greater than before birth. This is one factor often responsible for an increase in anemia in the first few days of life. Five or 6 days after birth, autopsy examination may reveal no evidence of erythropoiesis and the circulating blood may show no immature blood cells. Large amounts of hemosiderin may be found in the hepatic cells as a result of cell destruction; bile capillaries may be distended and thrombi may be present in the ducts because of inability of the liver to excrete all the products of cell destruction.

In our experience almost all infants who are severely jaundiced because of erythroblastosis who have survived more than 36 hours and who have died within the first week have shown evidence of the yellow pigmentation of the basal nuclei and related areas in the brain that has been designated kernicterus. It has not been present in any infants in our series who have lived less than 30 hours. I believe it is present in all infants severely affected by erythroblastosis during the period of greatest icterus and that the majority recover completely. If an infant dies during this period it does so because of some other condition and dies "with" kernicterus, not "because" of kernicterus. In a small percentage of infants who survive, a superimposed disturbance is responsible for varying degrees of neurologic damage.

Infants who are born with a severe form of the disease are often very edematous, a condition generally known as fetal hydrops. The plasma proteins of such infants are always low and the total volume of circulating blood is reduced. The specific cause of the edema is unknown athough the low plasma proteins are without doubt an important contributing factor. Such infants always show the most severe degree of extramedullary erythropoiesis, and the circulating blood contains greater numbers of more immature cells than any other form of the disease. Fetal hydrops may also result from unknown causes unrelated to maternal immunization and its existence, unsupported by other evidence, is by no means sufficient grounds on which to make a diagnosis of erythroblastosis.

A diagnosis of erythroblastosis cannot ordinarily be made until the last trimester of pregnancy or until the fetus is capable of an independent extrauterine existence. Possibly this is because it is already producing red blood cells to the maximum of its potentialities. Possibily it is related to the structure of the placenta and to a failure of antibodies to reach the fetus until after this period.

Dr. F. W. Helfrick, Manchester, Conn.: Is there a quantitative relationship between the degree of jaundice and incidence of kernicterus?

Chairman Pierce: I think it is fair to say that babies who develop severe jaundice rapidly and who show extreme degrees of erythroblastemia are more likely to develop kernicterus. Is this your experience, Dr. Potter?

Dr. Potter: Yes.

Chairman Pierce: But we have all seen babies who are severely jaundiced and anemic and who do not develop kernicterus. The complication of obstructive jaundice, secondary to plugging of the bile canaliculi with pigment, is evidence of excessive blood destruction, but may not be associated with signs of kernicterus.

Chairman Pierce: Dr. Potter, what is your observation regarding evidence for blood destruction in the fetus that dies after 16 or 18 weeks' gestation? Do you find evidence of deposits of iron in the liver, or plugging of the bile canaliculi at that age?

Dr. Potter: No.

Dr. Davidsohn: I would certainly agree with Dr. Potter; there is no kernicterus in a stillborn baby, and there is very little kernicterus in a baby who lives but a few hours.

Chairman Pierce: But we do not know whether these babies have suffered damage to the central nervous system, even through staining of the nerve cells characteristic of kernicterus is absent. Has it ever been proved that kernicterus is present in babies who are jaundiced from any other cause than erythroblastosis?

Dr. Potter: We have never seen it.

Dr. Davidsohn: I have never seen kernicterus from any other cause. This is in keeping with the experience in adult pathology, where it is well known that discoloration of the brain does not occur even in the more severe forms of jaundice. There are only a few cases reported of such discoloration following cerebral hemorrhage. As long as the barrier between blood and spinal fluid is maintained, kernicterus does not develop in the adult.

Question: How long has jaundice persisted in a surviving baby?

Chairman Pierce: Jaundice may persist several weeks if it is due to obstruction of the bile ducts secondary to excessive production of bile pigment. I have known acholic stools to persist for 3 months and jaundice to be still apparent for 5 months in a child who recovered completely eventually.

Dr. E. O. Jodar, Detroit: Does erythroblastosis ever lead to chronic erythroblastic anemia?

Chairman Pierce: I do not think so. I have seen cases where an anemia persisted for several months with an elevated reticulocyte count. In all but 2 instances a spontaneous recovery eventually occurred. In these 2 instances, excess blood destruction was demonstrable and increased fragility of the red cells was demonstrated. In one case a familial history of congenital hemolytic jaundice was demonstrated, in the other case it was not. Both children were benefited by splenectomy. It is my feeling that if a hemolytic anemia persists one should search for evidence of a chronic hemolytic process.

Dr. Jodar: Give us your idea of severe erythroblastosis. Should the number of normoblasts be used as a criteria for the severity of the disease?

Chairman Pierce: The classification of "severely affected" implies that (1) jaundice becomes apparent shortly after birth; (2) anemia and erythroblastemia is rapidly progressive and (3) signs of listlessness and apathy are present and may progress to more definite signs of central nervous system damage. I do not feel that the number of erythroblasts found in the blood shortly after birth necessarily indicates the severity of the disease but persistence of erythroblastemia is associated with the severity.

Dr. Jodar: The number of cases of erythroblastosis will differ with the hospital clientele. In a Catholic hospital in Detroit with a large obstetric service, mothers are delivered of their 2nd, 3rd, even 6th, 7th and 12th child, and such a service has a higher percentage of babies with erythroblastosis than in the average hospital. I know of one mother who had 5 babies with erythroblastosis in 6 years, including a pair of twins.

Another point I should like to make is in regard to the prognosis which one is asked to give to a pregnant woman who has had one or more affected children. I have seen 4 mothers, 3 of whom have had one previously affected child, and one who had had 3 previously affected children, and all 4 of the mothers gave birth to normal babies. Two of them were delivered by cesarean section, one because of the potential erythroblastosis and the other for another reason. One of the 4 babies was Rh-negative and 3 were Rh-positive, but none was affected with erythroblastosis. One of these mothers showed a rising antibody titer during pregnancy. Since I saw these 4 mothers who had had previously affected children give birth to normal children, it has seemed to me that one is not obligated to give a bad prognosis even though there have been previously affected children.

Dr. M. C. Bessire, Abilene, Tex.: Explain briefly the advantages and technics of the packed cell transfusion.

Chairman Pierce: We feel the chief advantage in the use of packed erythrocytes lies in the added number of cells that can be given without increasing the blood volume excessively. Thirty-five cubic centimeters of packed cells will deliver approximately as many cells as 75 cc. of whole blood, the hematocrit of which is 45. The simpest way to obtain cells without plasma is to allow the container of blood to stand upside down for a few hours and to draw off the sedimented cells with a large needle attached to a syringe. If time does not permit sedimentation by gravity, the blood can be centrifuged and the cells aspirated off by means of a long needle which will reach the bottom of the container.

Dr. J. R. Karel, New Jersey: It the subject of exchange transfusion versus repeated blood transfusion still a controversial point?

Chairman Pierce: I think it is definitely a most actively controversial issue and I think this is a good question to lead the discussion into a consideration of treatment in general.

Following the early reports of the favorable effect of exchange transfusions, this form of treatment has been used fairly widely, but whether it is the treatment of choice is not yet clear. We are dependent upon large scale clinical studies conducted under controlled conditions which indicate significant changes in the mortality to settle the problem. And even such a study may be inconclusive. In a recent paper by Vaughan, Allen and Diamond, an analysis is given of 539 cases treated at the Boston Lying-in and Children's Hospital. In this report it is carefully pointed out that the lowering of the mortality rate which occurred during the later years of the survey could not be ascribed entirely to the use of exchange transfusions but that other factors, notably early treatment and the

inclusion of the less severely affected babies in the group, might well have influenced the favorable trend in the mortality rate. However, the reported fall in the mortality rate since the use of the exchange transfusions at this center stimulated us to review our own statistics and re-evaluate our treatment.

In order to compare our results at the Chicago Lying-in and Bobs Roberts Hospital with those obtained in Boston where the number of cases seen each year is 3 to 4 times as many, we have analyzed our mortality rate since 1941 and arranged the figures in a manner which allows for comparison of the results in the 2 institutions. Our service is similar to the Boston service in that our pediatric staff is in charge of both the lying-in nurseries and the wards in the children's hospital. Our figures include only 16 babies referred for treatment after the first day of life. The following compares the results obtained from the 2 centers in the Boston hospitals.

1. The mortality rate in live born infants at the Boston Lying-in between 1937 and 1946 was constant at about 35% for these years, and fell to 20% between 1947 and 1948. This reduction in mortality rates was favorably influenced by the change in the criteria for diagnosis of the disease. Drs. Vaughan, Allen and Diamond point out the fact that since 1946, 24% of the live born infants included in these figures have shown no clinical signs of the disease.

2. The criteria for diagnosis was apparently much the same in the 2 centers until 1946, when less severely affected babies were included in the Boston Lying-in group.

3. A fall in the mortality rate occurred after 1946 in the Boston Lying-in group and Children's Hospital; no similar fall occurred in our group, and our mortality rate remained about 35 to 40%.

4. Our figures are drawn predominantly from the babies born at Chicago Lying-in; the inclusion of 12 babies referred to the Children's Hospital does not significantly change the figures.

5. In our figures the number of babies treated on the first day of life has remained fairly constant for each year since 1941, and the mortality rates are also constant, and the rate is somewhat lower (40% in 1946) than that obtained at the Boston Children's Hospital (60% in 1946). An improvement is noted in the Boston Children's Hospital group in 1947 when the number of babies treated on the first day of life was increased.

6. The chief difference in treatment in the 2 groups is the type of transfusion. In the Boston group exchange transfusions are used. At our center multiple small transfusions have been used on all but seven babies in whom exchange transfusions were given. In the small transfusions whole blood or packed red cells were used in amounts of approximately 10 cc. of whole blood/kg. body weight.

Comparison of the mortality rates obtained from the Boston and the Chicago centers permit the following conclusions:

1. The mortality rate fell in the Boston group coincident with (1) a change in the selection of cases for treatment permitting the inclusion of less severely affected infants in the group classified as "live born affected babies" and (2) a change in transfusion technics.

2. The mortality rates in the Chicago center remained constant over the same period while the selection of cases requiring treatment and the transfusion technics remained essentially the same throughout.

3. The mortality rate for the first day of life was lower in the Chicago center than at the Boston center before 1946, possibly because of earlier treatment and fewer "referred cases" (i.e. older and/or therefore more severely affected).

4. Since these differences exist in the selection of cases and in the time interval between birth and treatment within the same institution, it is not valid to conclude that the use of exchange transfusion is the significant factor in lowering the mortality rate for a given year at that center. Drs. Vaughan, Allen and Diamond have recognized this. Nor is it valid to conclude that it is a significant factor in assessing a higher mortality rate in a different center.

5. It seems more valid to conclude that our failure to obtain better results in the past few years is due to our more conservative treatment in general. To whit: our patients were transfused only after clinical signs of the disease were manifested by an anemia as revealed by heel blood puncture and a visible jaundice, and multiple transfusions with whole blood or packed red cells are used except in 7 babies who were given exchange transfusions.

As a result of these comparisons, we have decided to modify our practice in the treatment of our cases to permit earlier recognition of the disease and earlier treatment. In brief our present plan is as follows:

1. Infants born of mothers who show an increase in titered antibodies are candidates for exchange transfusions.

2. On delivery, cord blood is examined for the Rh-factor, Hgb, RBC and isoagglutinins.

3. When indicated exchange transfusions are given by a team using the umbilical route and Type O, Rh-negative female blood, the amount given being equivalent to 3 times the blood volume of the patient.

It is recognized that comparison of such a group of cases with our series collected between 1941 and 1948 will still be difficult since the less severely affected babies will be treated earlier, but it should be easier to evaluate the benefit of exchange transfusion in our own center if we can keep the selection of cases uniform over a long enough period to collect a statistically significant number of cases. The standard set by Vaughan, Allen and Diamond offers an invaluable stimulus for further critical surveys which must necessarily involve a long term program in centers where the case load is relatively small, such as ours.

Dr. H. F. Philipsborn, Jr., Glencoe, Ill.: I should like to discuss the problem of caring for babies with erythroblastosis in a general hospital where about 1600 infants are delivered per year. At the Evanston Hospital 250 infants were delivered of Rh-negative mothers in the past year. This indicates that approximately 15% of our maternal population during this year were Rh-negative, confirming previous statistics on the incidence in the general population. Of these 250 infants, 8 had sufficiently severe clinical signs to require transfusions.

In a hospital where the number of babies requiring treatment is as low as 8 to 10 per year, it is difficult for any one person to acquire judgment and skill in handling these cases. Such experience can be gained only when the staff members will make their patients available to one of their group or to a team for study and care. At the Evanston Hospital the following plan has been followed for the detection and care of the affected child: 1. Attending obstetricians are encouraged to refer all pregnant women to the hospital laboratories for Rh typing, screening tests and antibody titers if necessary. If no antibodies are detected in the first trimester, second screening tests are advised later in pregnancy. 2. A card index record filed according to the anticipated date of delivery on all mothers allows the members of the transfusion team and obstetric residents to know when a possibly affected child will be delivered. Preparations are made ready, the team is alerted and the appropriate blood is made available. 3. The transfusion team consists of 2 junior staff physicians and a skilled technician. I think it is important that physicians on the team be well trained and young enough to be enthusiastic, and yet experienced enough to have a measure of conservatism. Also I think it is important to keep one younger member at work on the team to guard against the day when the hands and eyes of the team fail. The obstetric and pediatric staff should allow this team ample freedom in the care of these infants.

Our experience is too limited to permit any opinion regarding the benefit of exchange transfusions as compared with repeated transfusions, since we have treated only 8 patients. One death occurred after an exchange transfusion which was given 72 hours after birth. It was felt that this failure was due partially to the delay before transfusion was administered, and also to an insufficient amount of blood. Our experience suggests that babies receiving exchanges transfusions are less anemic at the end of the newborn period than those babies who receive multiple transfusions.

It seems apparent that significant statistical data regarding the value of certain types of transfusion technics can only be obtained from hospitals with large obstetric services, or from children's hospitals to which a large number of these children are referred. Data derived from such centers should be sought and carefully evaluated by those of us with less experience. For example, one large center advocated at one time the premature delivery of an infant from a mother who had had a previously affected child and in whom erythroblastosis might be expected to occur. This same center has now revised its feeling in this regard since their experience indicates that prematurity is a handicap to the affected child. It is my feeling that clinical judgment must be exercised in following such recommendations as well as in others. Prematurity may be no handicap for a large baby; if the mother of such an infant shows a rapidly rising anti-Rh titer, and if there is a history of a previously affected child, premature delivery might be advisable. If other words, in a small hospital, one should not attempt to treat all patients in one fashion in the attempt to arrive at a statistical conclusion. The best way to protect the individual child is to be familiar with the material and methods in use in the larger centers and to adapt their results to the circumstances at hand.

TRENDS

By JOHN P. HUBBARD, M.D., *Contributing Editor*

This and subsequent descriptions of events and trends are intended to be unbiased and factual, presenting both sides of controversial matters so that conclusions may be formed from critical appraisal of things as they are. These statements do not necessarily reflect the opinion of the writer nor are they to be interpreted as official opinion of the Academy.

WE TAKE pleasure in calling attention to the Kentucky Child Health Foundation in the following contribution submitted by Dr. Alex J. Steigman. Although there have undoubtedly been many influences which stimulated establishment of this foundation, it appears fair to state that the Academy's *Study of Child Health Services,* and the continuing activities which it aroused, were at least in part responsible for this significant development.

Moreover, we wish to call attention to the fact that Dr. Steigman's appointment as Professor of Child Health in the Department of Pediatrics at the University of Louisville School of Medicine represents a noteworthy trend toward the teaching of child health rather than emphasis upon the diseases of children. Whereas departments of Child Hygiene have long been established in graduate schools of Public Health, this appointment, we believe, is the first in any medical school of this country under the heading of Professor of Child Health.

THE KENTUCKY CHILD HEALTH FOUNDATION

A Lay Organization to Promote Child Health Through Aiding Medical Education

By ALEX J. STEIGMAN, M.D.

KENTUCKY'S greatest resource is her people." This simple statement appears in bronze letters over the entrance to the Kentucky State Board of Health Building at 620 South Third Street, Louisville, Ky. The depth of sincerity of this simple credo is evident in many quarters, which agree that Kentucky's children, its future citizens, must be given every possible opportunity to survive and thrive. Great strides are being made in this direction despite numerous handicaps of finances, a rugged geography and a predominately rural population. A growing segment of community-minded citizenry of the State has had an increasing interest in the development of child health and has stood behind the medical profession in the attainment of this objective.

A rather unique lay organization has recently been organized in Kentucky to foster such objectives in a rather broad way. Its premises may be summarized as follows: (1) The ultimate key intermediary in health supervision and medical care of children is the doctor. (2) The health supervision of 82% of Kentucky's children is in the hands of the general practitioner. (The recently completed American Academy of Pediatrics' Study of Child Health Services and Pediatric Education in Kentucky has been a focal point in crystallizing the thought associated with the formation of this Foundation.) (3) As indi-

cated in the Academy survey the physician's opportunities for the study of children prior to going into practice and during the busy period of general practice, is insufficient and does not bring to the child the fullest benefits of many recent advances in the knowledge of complete child health. (4) Medical education is the neglected handmaiden to direct medical service. Improvement of the latter depends in no small measure upon improvement of the former. Although the immediate results are not as tangible as the completion of a building, it is firmly realized that the quality of care is determined largely by the quality of the professional personnel. (5) Organizations devoted to a specialized medical interest program, for example, poliomyelitis, heart disease, cancer, tuberculosis, cerebral palsy, are dependent entirely upon physicians for the achievement of their medical aims.

It therefore seemed inevitable to the far-sighted citizens who organized the Kentucky Child Health Foundation in 1950 that its ends could be best achieved in a long term program to support pediatric education and research. The group was not deterred by the realization that such programs may not stir the interest and support of individuals interested wholly in tangible and direct service programs. Organizations such as those having a specialized medical program as enumerated above were invited to send representatives to the organization meetings, and their interest and material support solicited. It was felt that public fund raising had no place in an organization of this kind. Whole-hearted support has been achieved entirely through far-sighted individuals and organizations without fanfare or publicity.

It appeared that the appropriate way of guaranteeing perpetuity for such a long range and never-ending program was by welding the aims of the Kentucky Child Health Foundation to the University of Louisville School of Medicine. In this connection the activators of the Foundation were wholly aware of the deep problems facing the medical schools of the United States today. Their view is in accord with that of George B. Darling, Director of Medical Affairs at Yale University, who has stated "The single most important national resource in the health field in the United States today is concentrated in our schools of medicine and their allied university departments." (*Atlantic Monthly*, June 1950.) Accordingly, the first major objective undertaken by the Kentucky Child Health Foundation was to establish a Chair in Child Health at the University of Louisville School of Medicine, of which the undersigned is the first incumbent.

The term "Child Health" instead of "Pediatrics" is interesting and deserves a word of comment. This was deliberately chosen in order to focus attention upon the total positive aspects of health in distinction merely to a study of disease of children. It is simply another step forward in the direction in which pediatrics has already been moving. At one time the term "diseases of children" was the appropriate name for our specialty. The importance of normal growth and development, emotional growth, social adaptation and the total impact of environmental forces upon the health status of a child are undeniable and it was felt that this trend toward a study of child health or child life was desirable and should be fostered.

In establishing this Chair at the University, no stipulation was made except to suggest that the incumbent be one who was trained not only in clinical pediatrics but have a varied background sufficiently colored to include interests in research and the field of pediatric education, applicable to both undergraduate and postgraduate levels.

The terms of reference provided for the Professor of Child Health have been broad and the widest latitude permitted. Many plans have been drawn or are in the process of being drafted which require the cooperation of the staffs of numerous institutions

and/or medical organizations. The unstinted interest and cooperation of these groups has been the most potent source of inspiration. A partial enumeration of some of these cooperative activities and plans might be of some interest.

That portion of the program which relates to instruction of undergraduate medical students and house staff is performed on the wards, nurseries and the Out-Patient Department of the Louisville General Hospital and on the wards of the adjacent Children's Hospital of Louisville under the direction of Dr. Leonard T. Davidson. A separate laboratory situated in the Medical School is now completed. The cooperation of the State Commissioner of Health and of the State Health Department has gone far beyond the usual "consultation and advice" level, and has included direct assistance in making many practical arrangements necessary for the conduct of postgraduate activities.

Close liaison with the Kentucky branch of the American Academy of General Practice has been considered to be very important. It is the general practitioner who provides medical counsel for the vast majority of American children, and in him resides a good deal of the future of child health. To date most of the preliminary arrangements with the Academy of General Practice have been made through its State office rather than at County levels. The members of the American Academy of General Practice who enroll for the decentralized courses of clinical and didactic instruction in child health receive Academy credit-hours for attendance.

The American Academy of Pediatrics in Kentucky although small in membership has been generous in its interest and time. Thus, Academy members not residing in Louisville and hence not directly affiliated with the University are serving as auxiliary instructors for the decentralized program. Their time and the availability of their patients for clinical instruction will add materially to the possibilities of successful decentralization of instruction.

Another example of a proposed cooperative venture with the Kentucky State Medical Association was discussed and approved by their Council at its recent annual meeting. It is to take the form of "consultation-seminars" to be conducted in several of the 15 Councilor Districts of the Kentucky State Medical Association. Didactic presentations will be avoided. A session of an afternoon and evening will be devoted to clinical material (patients and/or their records who are a source of diagnostic and therapeutic concern) brought in by the practitioners of that District. The content of the session will thus be made up of live material arising locally. It is hoped that the active participation of members of the group will replace some of the docile passivity which accompanies didactic reviews.

The undersigned has had some interest in experimental methods applied to problems in the teaching of pediatrics. As Dr. Powers pointed out several years ago, it is a curious fact that the methods of research which have provided such rich rewards in many fields of endeavor have not been applied to the problems which present themselves in teaching. When a number of teachers gather to discuss the art of teaching medicine, there are more impassioned pleas and suggested remedies than clarity and force in the statement of the problems and how one can best measure them. As an experimental teaching method, it is hoped to introduce a home care teaching program for undergraduate students. This will require the acquiescence and support of a great many local organizations. Its main purpose will be less concerned with the provision of medical care than with the adequate teaching of child health supervision and care of sick children in the total social and environmental surrounding of illness as seen in the home. A concurrent evaluation of methods and the

results will be made during the course of the experiment. The details of this particular plan have been worked out and the activation of the plan is hoped for during the next academic year.

Perhaps the meanderings of this report will give some idea of the diversity of activities now going forward. I think it is quite clear that little or none of this is wholly original, so far as teaching and service programs are concerned. However, the type of arrangement between a lay statewide organization made up of citizens interested in child health together with its local School of Medicine is a unique relationship of considerable interest. It indicates the potential of a spirited citizenry which can devote itself to long term programs if and when the need is sufficiently evident.

NEWS AND ANNOUNCEMENTS

The Chicago Pediatric Society held its annual Resident's Competition on April 17, 1951. The winners are as follows:

Tied for first place: Dr. Howard S. Traisman: The Use of Desoxycorticosterone Acetate in Dehydration and Malnutrition in Infancy.

Dr. Elmer R. Kadison: The Treatment of Infantile Diarrhea with a New Combination of Antibiotics.

Third Place: Dr. C. R. Castaldi (D. D. S.): Acute Infectious Gingivo-Stomatitis (Herpetic Stomatitis) and its Response to Oral Administration of Aureomycin.

* * *

The following diplomates were certified by the American Board of Pediatrics, Inc.:

Cincinnati—March 30 and 31 and April 1, 1951

Aldrich, Robert Anderson, 102 2nd Ave., S.W., Rochester, Minn.
Bates, Harriet Hegar, 9908 Nixon Drive, Dallas, Tex.
Batson, Blair Everett, Vanderbilt University Hospital, Nashville, Tenn.
Beale, Jefferson D., Jr., 841 Main St., Danville, Va.
Bertucci, Joseph A., 4901 W. Chicago Ave., Chicago
Biedel, Clark William, 245 Fourth St., Bremerton, Wash.
Booker, Armistead Page, Dept. of Pediatrics, Univ. of Va. Hospital, Charlottesville, Va.
Bourne, I. Blanche, 1712 16th St., N.W., Washington, D.C.
Boutourline-Young, Harben Jay, 66 Park Rd., Weston, Mass.
Brown, Wendell E., 3750 N. Gale St., Indianapolis
Buchert, Charles H., 313 S. Main St., Middletown, Ohio
Ceresko, Anthony R., 18650 W. Warren Ave., Detroit
Clark, Hugh Gambel, 2146 Wyoming Ave., N.W., Washington, D.C.
Coleman, Joseph E., 216 S.E. Riverside Drive, Evansville, Ind.
Duffy, Thomas L., U.S. Naval Hospital, Great Lakes, Ill.
Erickson, Gustaf Walter, Jr., 207 Wildmere Drive, South Bend, Ind.
Garrison, Roy Francis, 5226 Swope Parkway, Kansas City, Mo.
George, George S., 4765 Lincoln Ave., Chicago
Gilbert, Benjamin Pierce, 100 Grove St., Gainesville, Ga.
Graham, Bruce Douglas, Dept. of Pediatrics, University Hospital, Ann Arbor, Mich.
Haffner, Frederick D., 3860 Middleton Ave., Cincinnati
Hand, Albert Moore, 619 Main St., Texarkana, Tex.
Henderson, Arvin T., U.S. Naval Hospital, San Diego, Calif.
Hertzog, Frank VerNooy, 719 W. Water St., Elmira, N.Y.
Hess, Edmond Richard, 4554 N. Broadway, Chicago
Horak, Oliver Adolph, 722 National Bank Bldg., Lima, Ohio
Isaacson, Edward Kenneth, 1791 Howard St., Chicago
Johnson, Frank K., 946 Kenwood, Beloit, Wis.
Judge, D. Joseph, Mayo Clinic, Rochester, Minn.
Kalick, Peter, 4529 Sherman Oaks Ave., Sherman Oaks, Calif.
Laux, Philip J., 1995 Washington Blvd., Birmingham, Mich.
Lowe, Charles Upton, University Hospitals, Minneapolis
Martin, Frederick J., 153 Meadowbrook Rd., Rochester, N.Y.
McIlvoy, Daniel Bernard, Jr., 1109 State St., Bowling Green, Ky.
McKinney, J. Schuler, 428 N. Washington Ave., El Dorado, Ark.
Moore, Frederic P., II, 2042 Park Ave., Richmond, Va.
Nelson, Lloyd Stanley, 3922 First Ave., South, Minneapolis
Olney, Robert B., 1015 Gayley Ave., Los Angeles

Pensler, Leslie, 8844 Joy Rd., Detroit
Pestillo, Mario Peter, 711 E. Genesee St., Syracuse, N.Y.
Richardson, Francis L., 711 Longshore Ave., Philadelphia
Ripy, Howard W., 433 Henry Clay Blvd., Lexington, Ky.
Rogers, Charles W., 172 Main St., Winona, Minn.
Rothwell, Robert Smedley, 902 Boston Bldg., Salt Lake City, Utah
San, James M., 442 W. Lafayette St., Tampa, Fla.
Scott, Robert M., 922 "C" 29th St., Sacramento, Calif.
Smith, Theodore S., 400 Doctors' Bldg., Minneapolis
Tandeta, Morris, 8298 Vine St., Castro Valley, Calif.
Tanner, Natalia Murphy, 6637 S. Vernon Ave., Chicago
Thorne, Lansing Stephen, 3729 Ledgewood Drive, Cincinnati
Turin, Richard D., 755 Ocean Ave., Brooklyn
Walliker, George F., Jr., 1553 S.E. Henry, Portland, Ore.
Warren, Sydney A., 167 College St., Toronto, Canada
Watson, James Donald, Colorado Springs Medical Center, 209 S. Nevada Ave., Colorado Springs, Colo.
Wilkes, Frederick B., 4536 Main St., Buffalo, N.Y.

* * *

Dr. Frederick Henry Maurer of Peoria, Ill., died on April 22, 1951. He was a fellow of the American Academy of Pediatrics.

* * *

Dr. Paul M. Hamilton of San Marino, Calif., died on April 9, 1951. He was a fellow of the American Academy of Pediatrics.

BOOK REVIEWS

SOCIAL MEDICINE—ITS DERIVATIONS AND OBJECTIVES, The New York Academy of Medicine Institute on Social Medicine, 1947, edited by Iago Galdston, M.D., New York, The Commonwealth Fund, 1949, $2.75, 294 pp.

Mindful of the findings of its Committee on Medicine and the Changing Order, the New York Academy of Medicine, in connection with its centennial celebration, held an Institute on Social Medicine in the spring of 1947. To this institute came 50 eminent participants representing a wide variety of professional backgrounds. The group included historians, physicians, philosophers, public health and nutrition experts, educators and administrators, psychologists and sociologists "each to contribute to the pool of thought from which the idea of social medicine might rise and form."

To stretch the metaphor, the resulting pool as reflected in the 25 individual papers presented here is not entirely crystal clear. Although the job of editing is skillful, the fact of multiple authorship, approach and literary style, plus the fact that the subject represents a relatively new concept, handicaps but does not prevent the reader from emerging with an indelible idea of the nature of social medicine.

Throughout the book the term "social medicine" is defined from a variety of viewpoints. Clinical medicine is concerned with the individual; social medicine is concerned with the group. Clinical medicine grows from collaboration of the physician with the anatomist, pathologist, physiologist and others. Social medicine attempts to apply clinical medicine to man in his community through collaboration with the epidemiologist, sociologist, anthropologist, social worker, statistician and others. One paper contrasting social to individual pathology points out that whereas the latter is interested in seeking the specific etiologic agent, the former in addition to the specific agent is interested in taking into account the influence of age, sex, race, heredity, economic circumstance, domestic environment, occupation, nutrition and education as well.

The point of view is presented that clinical medicine and social medicine have tended to develop along parallel lines rather than to intermingle. It is with the integration of these disciplines and the "realization of how rewarding the orderly study of social pathology can be" that this book deals.

Many of the papers are individually excellent. Some of them might well be selected as required reading for all medical students. Pediatricians with their basic interest in preventive medicine will find the book, as a whole, provocative and timely.

BASIC PRINCIPLES OF VENTILATION AND HEATING, Thomas Bedford, D.Sc., Ph.D., London, H. K. Lewis & Co. Ltd., 1949, 25s, 401 pp.

While this small volume does not apply directly to medical practice, it does contain many informative paragraphs applicable to the maintenance of health. In the preface Dr. Bedford states: "My purpose in preparing this volume has been to deal with ventilation and heating in terms of human needs." This he clearly brings out in such chapters as "Body Heat Production and Heat Loss," "Warmth and Comfort," "The Quality of the Air," "Domestic Heating" and "Effects of Atmospheric Conditions on Accident Frequency and Sickness." Those interested in hospital, office or school construction will be repaid by reading this well organized volume.

INFANT NUTRITION: ITS PHYSIOLOGICAL BASIS, F. W. Clements, M.D., D.P.H., D.T.M., Baltimore, William & Wilkins Company, 1949, $4.50, 246 pp.

This book will be extremely useful as a source of data for the practicing pediatrician and research worker. The author, who is Senior Medical Officer in the Department of Health, Commonwealth of Australia, presents it as "largely a collection of the relevant and related facts culled from scientific papers . . . during the past two decades, with occasional references to personal experiences and observations." As such, it represents a good piece of work; its 246 pages, 42 tables, 14 charts and extensive bibliography certainly comprise the available information. In the more difficult field of

critical interpretation for the conscientious clinician the book is somewhat less satisfactory. Of this one can scarcely complain, since in the present phase of nutritional research only a physician of vast experience (or an extremely incautious one) would presume to evaluate for clinical use the relative importance of each item Dr. Clements has here supplied.

The 12 chapters progress from considerations of tissue metabolism and fetal nutrition to discussions of application of principles, and disturbances of metabolism related to dietary causes. Much the longest, and of unique value for its details, is that on the chemical and physical properties of human and cow's milk. If Dr. Clements would now devote the industry evident in this volume and the advantages of his important medical position to a practical assay of all this material, he would be performing an even more valuable service for workers in public health, obstetrics and pediatrics.

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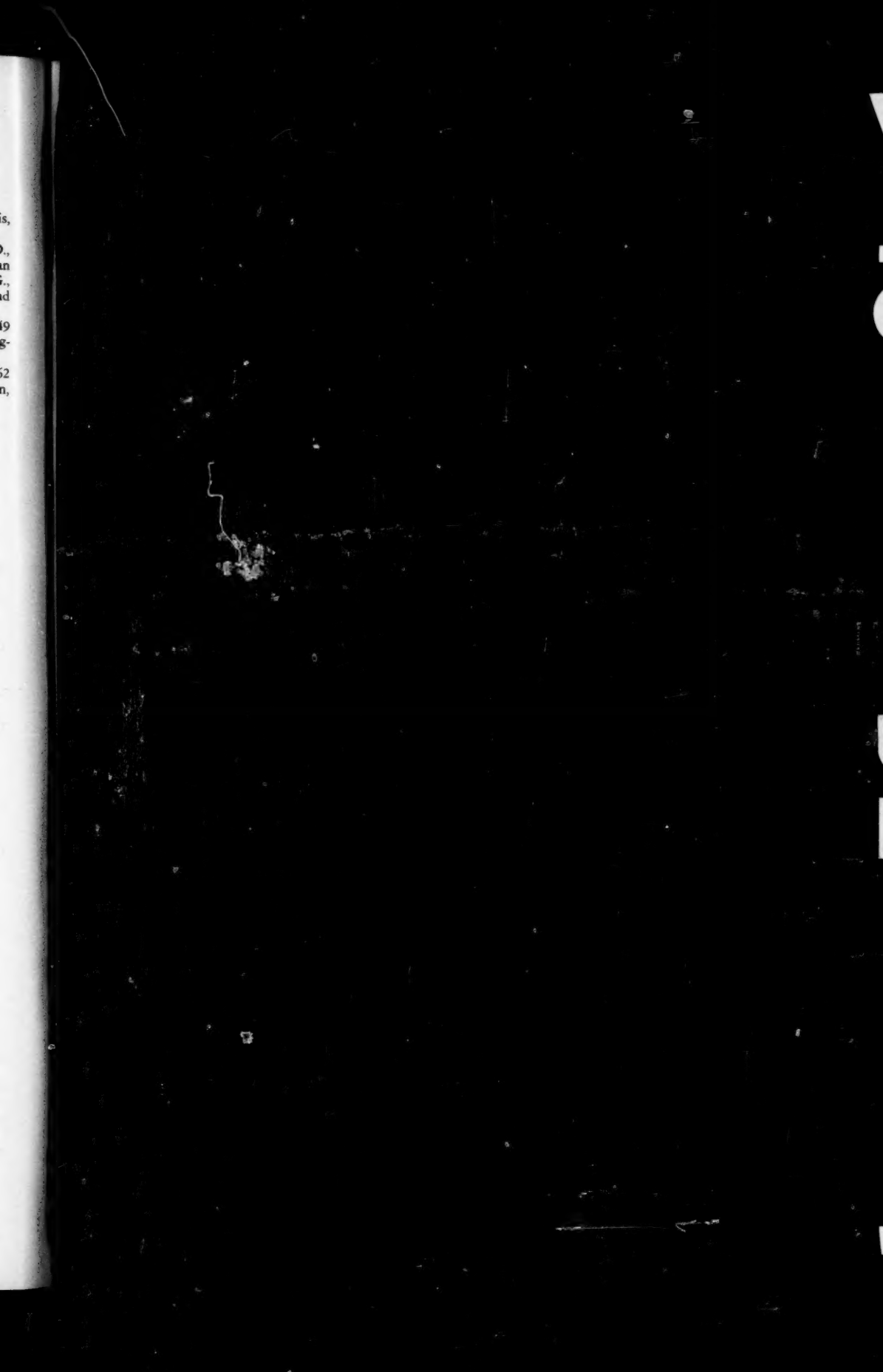
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